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THE MONTHLY FOR RESELLERS

MAY 1997 Vol.3 No.5

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PC Graphics: Not Just Pretty Pictures

Think about this intriguing phenomenon: Kids across the country are regularly hooked up to their basement for countless hours, sitting in front of their computer screens until the wee hours of the morning. They're rendering large graphics files, manipulating images, doing raytracing, drawing, experimenting with fills, light sources, reflection.

If you ask them "Why?" (believe me, I have), they'll shrug, and say "For fun." Of course, it's not just the kids who are getting their kicks from experimenting with and putting the limits on computer graphics. As members of hardware, graphics software, hard drives and RAM — you can no doubt attest to this craze. As a hobby, it unquestionably has merits. "It keeps them off the streets," shrugged Kai Krause, graphics guru, plus colorist, and service and design officer for MetaTools Inc.

Yet, beyond the entertainment value, these people who are really getting their minds around their digital graphics are preparing for the new reality, as advances in graphics and perhaps even more critical — processing power, drive and change not only the interfaces we'll work with, but the capabilities of computing.

Krause was on hand for the recent Intel Platforms for Visual Computing briefing day in San Jose, Calif. (Please see "Intel Meets 'Visual Computing' Peak," page 16.) Industry players showed off the latest in computer graphics, 3D, video capabilities, and discussed the potential impact on such sectors as entertainment, medicine, retailing and business.

3D Photos

One of the most telling demonstrations came perhaps from MetaTools. The company invited Craig Berni, executive vice-president and CDO of Intel to take a seat in front of a camera-like device. He obliged. A moment later, his visage appeared on the overhead computer screen. The audience nodded intently. Digital cameras are certainly a growing market but not exactly gump-wrenching material.

But that was just to come. The demonstrator clicked on the photo of Berni, and there reappeared the 3D image of his head. And there was the audience gasp!

The technology comes from MetaTools' partner RTG Technology. The "camera" is an RTG 3D scanner. The company claims "scanning a human face results in a model of approximately 10,000 triangles, complete with a super high-quality texture map, in 0.5 seconds on either a PC or SGI platform. The output model is optimally triangulated and ready for editing. Large objects can be scanned as parts and then the triangle-based data "glued" together as a single 3D image." For more on the technology, and to view some 3D photos, check out: <http://www.metatools.com/rtg.html>

Think of the implications for on-line catalogs. Imagine, not just seeing a photo of your potential purchase — what if you could turn it around, examine it from every angle, open it and manipulate it?

The future is graphical, and it's not just window dressing — it's a meaningful evolution of computing.



Good News Graphics

For retailers, it's only good news. The processors are getting faster, the computers are ever-increasingly powerful, drawing and accommodating these new scenarios is an intriguing chicken-and-egg footnote. Networking capabilities will definitely have to speed up. The need for high-quality printing will only see increasing growth. (Please see "Preparing For The Printer Market In 1997," page 26.)

Memory and storage requirements are already exploding and as your users look for more capability to handle the massive files that are being created, expect due to only accelerate. Be sure to check out CCW's special Lab Test report this issue on hard drives, on page 38. And check out "The Irresistible CD Fields Opportunity," page 30.

Meanwhile, remember many of these kids who come into your stores to pick up an extra 16MB of RAM, may be doing very significant work for major corporations in just a short while.

And if you have someone sitting away at computer creations late at night in YOUR basement — well, be sure to leave a light on. ☺

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Is Windows CE Ready For Banking With IE?



I read your Editor's Desk article regarding Windows CE. I was wondering if the IE version in WinCE has the low-level security in it?

This would help if people wanted to bank on-line.

Also, do you know when Philips Velox is coming out to the public?

Myra Le

Electrical Technician

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Editor's Note: Windows CE 1.1 has added support for Secure Sockets Layer (SSL 2 and SSL 3), and Private Communications Technology (PCT). Users of Verizon 1.0 can download an upgrade from <http://www.verizon.com/windowsce/>.

There are a variety of features that can be found in the full-fledged desktop version of Internet Explorer, but not on the handheld. They include support for scripting languages such as JavaScript, JScript and Visual BasicScripting, animated objects such as GIF, AVI, MPEG, and MOV (QuickTime) objects, MNN, AI, and AIFF sound files, ActiveX controls and cookies. For a full list, see <http://www.microsoft.com/windowsce/development/development.html> and <http://www.microsoft.com/handhelds/ce/610199.htm>.

However as Bill Gates himself says, this is just Version One of the Windows CE handhelds, and we should expect to see significant improvements in subsequent releases.

According to Philip's Web site — <http://www.seri.com> the Velo has just started to ship. Hewlett-Packard's Jaguar mini J264X should also start shipping this summer. ☐

We welcome your letters on industry issues and concerns, and your comments on our magazine. We reserve the right to edit your contributions for length and clarity.

Please write to The Editor, via E-mail at ew@cpa.ca or fax: (604) 608-7556.

CCW Bulletin Board

Vancouver VAR Seeks Sourcing Partners

I have recently started up a VAR business, a small-time PC system reseller. I would like to be pointed in the right direction for sourcing software (including OSs, suites, apps and games) as well as a good PC hardware source or sources. I do not intend to resell assembled systems, but to piece them together from the case up.

Any assistance you could offer in helping me to create a competitive, successful VAR business would be appreciated.

Robert W Pirnie

President

Pirnie Engineering Solutions

Vancouver

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INDUSTRY FLASH!

New standard supports critical Java applications

Despite all the hoopla about the potential of the Java programming language to re-define the computer software market, previous little in the way of commercial Java applications has made it into this market so far.

However, the appearance of real, shrink-wrapped Java applications may have been brought a step closer due to some major vendors in the way of commercial Java applications have made it into this market so far.

On April 4, IBM, Oracle and Tandem announced an alliance designed to specify a new Java language extension, named JSQL, to help create business-critical Java database applications.

According to Jon Kaseoguard, vice-president of software products of the JavaSoft division of Sun Microsystems, "JSQL will help bring Java to the enterprise by creating Java database applications that are written entirely in Java. Oracle, IBM and Tandem working together to drive this specification shows continued innovation and momentum for Java in the enterprise."

One of the key building blocks for successful use of Java applications is the ability to write Java applications that can easily gain access to relational databases.

A draft version of the JSQL specification is now available for download from <http://www.sqlsoft.com/tech/compat.htm>.

Intel demonstrates Pentium II in NetPC

(NIO) — Andy Grove, chief executive officer of Intel Corp. recently demonstrated the next generation of Pentium microprocessors, Pentium II, in a rebranded computer, called NetPC.

"This is the first time the world of the 486 microprocessor to the Pentium microprocessor was a major progression for the world of computing," began Murray Voss, spokesperson for Intel. "After the Pentium came the Pentium Pro. Now, we see Pentium II as the next major progression in microprocessors. It will deliver a level of performance which will exceed the industry."

Voss also said, "There is a lot of talk about which microprocessor has the most speed. We can all talk about 300, 366 and 400MHz processors, but performance is what counts and performance comes from more than just clock speed." His comments focus on Pentium II which, according to Intel, represents an entirely new form of microprocessor.

Pentium II does not have pins similar to its predecessors. It also does not have the standard ceramic cartridge. Pentium II has a plastic and metal cartridge called "Single Edge Contact." Instead of the multi-pin connection to a motherboard, Pentium II fits into a slot, called Slot 1, similar to a PCI slot.

"As we move forward into an era where tens of millions of people will be buying computers, Intel has to have a microprocessor which can be produced dependably and rapidly in high volume," added Voss. "Pentium II is the design which makes that possible."



Andy Grove,
Intel CEO

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NEWS

We welcome your ideas regarding news and feature topics for Canadian Computer Wholesaler. Feel free to contact the editor directly with your suggestions.

TEST LABS

We'd like to hear your feedback and suggestions on our Test Labs reviews section.

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DVD Consortium announces licensing plans

(NR) — The 10 companies that make up the DVD Consortium, an exclusive club that only companies which hold DVD-related patents can join, has announced the completion of licensing plans for the new system. It means that companies outside the 10 consortium members are now free to license and manufacture DVD-based technology.

Under the new plan, which is only an interim solution before full licensing is worked out, companies can get a license for the DVD system and logo from Toshiba, which is acting as a representative for the consortium. Excluded from this license are DVD patents, which will still have to be licensed from each patent-holder.

Licensing of the system will cover any device associated with DVD including players, drives, other equipment and discs for both DVD-Video and DVD-ROM. Devices or discs that conform to the specifications will also be able to carry the DVD logo. Licensing is available through Toshiba DVD Business Promoters and Support, DVD Products Division, in Tokyo.

The DVD Consortium is made up of Hitachi Ltd., Matsushita Electric Industrial Co. Ltd., Mitsubishi Electric Corp., Philips Electronics NV, Pioneer Electronics Corp., Sony Corp., Thomson Multimedia, Time Warner Inc., Toshiba Corp. and Victor Co. of Japan Ltd. (JVC).

Internet Explorer preview saw an on-line distribution surge

One of the great questions for resellers is whether or not distribution and sale of software via the Internet will replace sales by traditional distributors, resellers and VARs. On April 7, one of the largest software distribution services on the Internet, TUCOWS (The Ultimate Collection of Microsoft Software) claimed to have distributed more than 500,000 copies of Microsoft Internet Explorer 4 Platform Preview Release in less than 48 hours.

TUCOWS has more than 150 affiliate sites around the world, according to TUCOWS founder Scott Swenson. "All my mirror sites are flaming on this crisis. One server in Australia told me their [download] statistics went up over 9000 per cent. More than 1,000,000 copies have been downloaded since Saturday when the software was first put online. It was difficult to determine exactly how many were downloaded during the first 24 hours due to technical difficulties, but we believed that this was one of the busiest days of downloads in our history."

There has been great interest in IE (Internet Explorer) 4.0, due to its decreased features, which will allow it to integrate more closely with the Windows 95 desktop. IE 4.0 is widely expected to offer a large, well-integrated suite of tools ranging from E-



mail or Web authoring, broadcasting, and conferencing. It's also supposed to support off-line reading of Web sites and to offer automatic updating notifications.

To date, downloading demo versions of software over the Web has been an effective marketing tool for some software publishers, though relatively few full versions of software have been offered, mostly due to the slow speed of most Internet connections. Software publishers who got the best response to offers of preview versions of their software tend to be companies with "hot, well-advertised, popular software. Games software such as "Doom" and "Quake," Web browser software such as Netscape Navigator and Microsoft Internet Explorer, and business productivity software such as Corel's own office suite beta have generated thousands of downloads in short periods of time.

For more information, contact <http://www.download.com>. □

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IBM Canada signs Supercom for Aptiva home PCs

IBM Canada has added Supercom to its authorized distributor of the Aptiva line of home computers.

Markham, Ont.-based Supercom joins Bestimage as an authorized Aptiva distributor.

"With the recent expansion of the Aptiva line to include three distinct product families, IBM felt the time was right to also expand the reseller base for Aptiva," said Gary Isaac, general manager, consumer channels, for IBM Canada, in a statement.

Montreal's MEI releases UniverSell for sales automation

MEI, a Montreal firm that has achieved rapid growth internationally with its sales automation software for mobile computer users, has announced the release of UniverSell, its next generation of salesforce technology. "UniverSell was developed in response to three major trends affecting organizations today," according to MEI president Anthony Gosselin. "Corporate investment in technology is growing in strategic importance; companies are becoming more global and sales representatives need to be more effective wherever they are; and management is required to achieve more results with fewer resources."

UniverSell has been engineered to allow users to employ the Internet, LANs or other connectivity options to synchronize data between mobile users and PC, server or mainframe based databases.

For more information, contact <http://www.universell.com>.

Lotus says: get your motor running: win a hog

In an effort to rev up sales, Lotus Canada has introduced a SmartSuite 97 sales promotion that is aimed at appealing to the "Wild One" lurking inside that enterprise or SOHO software buyer's wild, untamed interior.

Until May 31, Lotus Canada states, any qualified interest in the Lotus "Win A New Way To Work: SmartSuite 97 Acceptance" promotion has a chance to win a Harley-Davidson XLH Sportster 803 Ragger motorcycle.

Lotus International, general manager of Lotus Development Canada showed off both her flagship software title and the Harley for the official launch of the promotion on April 10.

Entry forms and contest details are available at a wide range of participating retailers, such as Future Shop, PC Home Computing, Computer City, Business Depot/Maples, Dapolar, London Drugs and Office Depot. The promotion is not being run in Quebec.

For more information, contact <http://www.lotus.com/canada>.



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Former Bell & Howell executives launch company

Former Canadian executives of Bell & Howell Ltd. have acquired that company's Document Management Division for an undisclosed amount.

The new company is called DocuCom Imaging Solutions Inc. Raymond Patterson is president and Martin Moffat is vice-president.

The Toronto-based company will continue to market and service Bell & Howell's document management products under a distribution agreement with Bell & Howell. The company will also support such suppliers as Meridia Corp., Microfilm Technology Corp. and Kodak Canada Ltd.

DocuCom Imaging Solutions will employ the division's 85 employees and will assume responsibility for office facilities across Canada.

The company can be reached at (416) 745-1141.

Microsoft launches suit against reseller

Microsoft Canada Inc. is taking an Ottawa-based reseller to court, citing piracy.

According to Michael Eisen, legal counsel for Microsoft Canada, the company commenced an action in the Federal Court of Canada on March 24 against Compulinks Canada Inc., which operates under the name Alcan Systems, in Ottawa.

Microsoft is alleging that reseller sold 500 computers to the Ottawa Board of Education that were loaded with copies of MS-DOS 6.22. Eisen said the board also's receive licenses to MS-DOS with the computers, and eventually contacted Microsoft on the matter. Eisen said Microsoft is seeking an injunction to prevent Alcan from infringing on Microsoft's patents, and is seeking damages.

Alcan Systems' owner Ramon Agarwal has said, via statement, "In reality, the problem surrounding the Ottawa Board situation relates not to software piracy, rather it is purely a technical matter involving sale of unswappable to the client for the best price advantage under their tight budget constraints."

A separate statement from the company called a "regretful" that Microsoft is attempting to "defame and prosecute a small business in the media without waiting for the due course in letting the judicial system take a decision based on facts." □

Taking a bite out of Apple

Restructuring of the Mac maker leaves some technology by the wayside.

by Gary Davies

Gilbert F. Amelio apparently thinks his company has lost a few battles, but is still a long way from losing the war. The chairman and CEO of Apple Computer Inc. last March pulled back from its roads made into new markets and technologies, announcing that his company would return to its roots and focus on the markets that made it one of the more popular computer companies of the mid-1980s: consumer, education, publishing and new media.

It was a move that not only resulted in a complete restructuring of Apple's corporate hierarchy, but also saw a number of popular, and not so popular, technologies fall by the wayside. "We've gone to a more functional organizational structure internally," says Peter Jones, president until last month of Apple Canada Inc. "And from a technology standpoint, we're simply focusing on aspects that our customers are looking for — portability, low-cost, Mac-like features."

The technological losses are unfortunate in the ongoing war for the personal computer market, but Amelio says his company's top priorities must be "the rapid delivery of distinctive products for our loyal business, education and home customers."

The human losses were extremely hard. Across the board, 4,000 staff had their jobs in the restructuring, 41 of which were employed at Apple Canada Inc., including the president Peter Jones. The majority of responsibilities usually handled by Jones have now fallen into the hands of functional managers who will report to their head-office counterparts.

"I'm of two minds on the changes," says Michael O'Neill, senior vice-president of IDC Canada. "On one hand, you're better off having strong local management, but on the other hand, they're still missing their marketing out of the U.S."

But what has the majority of Apple been selling these days was the company's decision to discontinue development of no fewer than seven Apple products. The company announced it would no longer invest in the OpenDesktop architecture or CyberByte browser, AIX server operating systems, Mac OS development tools,

Apple Video Conferencing, Open Transport and Game Spookers.

More losses will instead be placed on "the delivery" of the company's next-generation operating systems, code-named Rhapsody, Jones says. "When we articulated our strategy it was to move toward Java-based technology, which is becoming the industry standard."

Rhapsody is based on technology acquired from Apple co-founder Steven Jobs. Amelio reportedly paid Jobs US\$250 million for his Next Inc. software company and has made him a special adviser to Apple. While much has been rumored about Rhapsody, most will have to wait until next year to try the new operating system.

"Our long-term strategy has always been to focus on our operating system," Jones says. "The Mac OS has been the difference for the company since 1984."

Amelio's decision to concentrate more on the development of the Macintosh operating system is interesting in light of a recently released report which showed the company's market share in the U.S. desktop channel on the rise.

New research from Computer Intelligence, released a week prior to Apple's announced restructuring plans, indicated the Mac OS platform was taking market share from the x86 platform. Figures indicated the Mac OS share rose to 11 per cent in January 1997 from just eight per cent in November 1996.

"I think it might be more important for Apple to look at customer market share in their important markets, rather than what constitutes total market share overall," O'Neill says, noting the company will likely never rise above 10 per cent in the PC market.

The results mirror computer intelligence's earlier analysis. Doug Tremblay, who comments in the same issue, "You'd expect the share rise, the Mac OS market can be sizable even as Apple shrinks."

Tremblay also indicated the company's move into the Mac clone market as a "major strategic and growth" to the platform. "It's worth equal to 51 per cent over a two-month period."

"When Gilbert Amelio left took a lot of

positions in February 1996, he said this would be a three-year transformation, and we're only at the end of year one," Jones says. "We feel confident we can win the company into the black by the end of this fiscal year."

The discontinuation of several Mac products will certainly help in that effort. Doug Bowman, owner of the Mac Classroom in Calgary, says users won't miss much of what was left on the chopping block. "Generally, most of the technology that was eliminated, wasn't of good use."

The one exception, though, is Open Transport. I think that was a big mistake. But the dumping of the remaining products was long overdue. I think it was a classic situation of a lot of marketing types at Apple working themselves into toxic positions and being there for too long."

On the hardware side of things, Apple decided to cease production of its Performer line of products in favor of the Power Macintosh brand. The company said it would help to eliminate confusion for customers trying to decide between Performer products and Power Macintosh models, all of which have PowerPC microprocessors.

"There's been a lot of problems with the Performer model," Bowman notes. "The original 603 chip had some major problems, and there were some real bugs out there. The 5300 was a real nightmare."

Although it's highly true Apple realized it was being off more than it could show "Apple has photographed his vision of itself as a grand provider of rich tools. Hardware, software, it didn't matter. I think you're starting to see a realization that that was way too much of a mission — being company — serve for IBM."

If there have been any real beneficiaries of Apple's moves, however, it has been companies like Motorola, which are shipping clone models in a rapid pace.

O'Neill says Motorola can't make enough clones to satisfy the demand out there.

"The new Macs we'll build lately," Bowman says, "we've sold 10 to 12 clones."

Gary Davies is a Calgary-based journalist who specializes in high technology and business reporting.



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Dealers
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Intel Makes 'Visual Computing' Push

Microprocessor giant announces strategies, partnerships to push the envelope on PC graphics

by Grace Courtenay

Intel Corp. is one of the most profitable corporations in the world, and that's unlikely to change any time soon, as long as that company turns out more and more powerful microprocessors, and while the buying market continues to clamor for increased processing capabilities. But just in case, Intel is setting itself up as something of an evangelist, promoting and encouraging emerging technologies and markets that will need all the processing power Intel is able to squeeze out of its silicon.

Top on that list is something Intel is calling "visual computing," as the company works to push the acceptance of high-performance 3D video and imaging on the desktop.

Peter Christy, market analyst and president of MicroDesign Resources, in San Jose, Calif., said Intel is searching to identify "what could people possibly want that drives them to need processors more powerful than 166MHz Pentiums?" Intel is now moving into broad technology integration," he said. For example, highly graphics intensive and 3D markets will be able to make use of such technological advances as MMIO, Intel is working to "rev up the industry and create demand," he said.

Christy commented: "This is what Apple was really good at until it ran out of money."

Intel recently sponsored a special customer/partner briefing day in San Jose, Calif., called Intel Platforms for Visual Computing. At that, Intel announced a series of partnerships on the visual computing front. According to Christy, not only do those partnerships give Intel a chance to promote emerging markets, they also allow pertinent development to give important feedback on Intel develops its next round of processors.

"We really see us in battle for the user's attention," said Craig Barrett, executive vice president and COO at Intel. While more PCs will be sold this year than television sets, people will spend twice as much time in front of their TVs. "By 2003,

we're looking for more person hours in front of the PC."

However, content has a ways to go. People are used to a certain quality of content from their TVs, "and they want no less on their personal computers."

AGP Supporters

Eight graphics chip companies, including 3Dlabs, ATI, Cirrus Logic, Evans & Sutherland, NVIDIA, S3 and Trident say they will ship Accelerated Graphics Port products in 1997. Intel also announced development of a high-speed extension to the specification (to be incorporated in QPI, called AGP 4X mode). It will double the bandwidth of AGP to 1GB/sec, and is targeted at high-end workstations.

Avid Investment

Intel announced a US\$14.75 million investment in Avid Technology Inc., a developer of video and audio editing products. As part of the agreement, Avid will develop digital content creation tools for Intel-based systems. This deal gives Intel 6.75 per cent ownership in Avid.

"William Miller, chairman and CEO of Avid Inc., in a statement: "This agreement marks a significant milestone in Avid's drive to bring powerful digital content creation solutions to the millions of potential users in corporations, government, academic institutions, small business and homes. Intel technology-based companies are the clear volume leaders in these market segments."

Kodak Partnership

Intel and Eastman Kodak Co. also teamed up to advance a number of industry specifications for consumer PC imaging, including digital cameras and PC-based editing, storage, communication and manipulation. PhotoPix (supporters include Kodak, Hewlett-Packard, Lotus

Picture, Microsoft) will leverage MMIO to speed image manipulation and processing. Future Kodak ImageMagic visual streams will include support for Universal Serial Bus

and the Intel Multimedia Card format. Moreover, both Intel and Kodak will promote the Kodak Picture Network — a set of digital services meant to supplement capabilities at the desktop.

Kodak says more than 17 billion photos are taken with conventional cameras yearly in the U.S., and opening IDC figures, expect 15 million digital cameras will be sold annually by the year 2000.

"We're not in the film business, and we're not in the digital imaging business, we're in the business of pictures," said Carl Gustin, chief marketing officer and senior vice-president for Kodak. "We want to capture and post pictures, capture manuscripts and more than that, and communicate them from Point A to Point B. MMIO technology, (instant) flash memory and USB are very powerful contributions that Intel brings to the party."

"Intel and Kodak are two powerful alliances," said Gustin. "It can ultimately benefit camera and PC users in a way that will add up to more than one plus one equals two."

Rail Trails

One of Intel's guest speakers was Ron Kottmeier, co-founder and vice-president and design officer for MetaTools Inc., of Capistrano, Calif. He said, regarding graphics-intensive, visual computing, that it's inevitable everyone, whether they want to or not, will be in this game.

But he said there's still a lot of work to be done on software interfaces. For example, he said when someone picks up a tool for example, a paintbrush — it should look and work like a real paintbrush, with shadows and realistic movement.

He cited the interface on word processing packages, for example. "Someone picks it up, takes at least one more go at that," said Kottmeier. □

Grace Courtenay is Editor of Canadian Computer Wholesaler and can be reached at grace@wholesaler.ca.



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Compaq Eyes Opportunity In New Markets

by Bruce Gassman



Armada 1300

Compaq Computer Corp. president and CEO Richard H. Pfitter says he wants Compaq to be one of the world's top three computer companies by the turn of the century. "Today we're the fifth largest computer company in the world," said Pfitter at the recent Internet '97 Forum in Houston.

He said Compaq has "both feet on the accelerator to speed to its one year 2000 goal of being one of the top three computer companies in the world."

Customer Delivery

In late March, Compaq launched its OpenSource Customer Delivery Initiative. It includes a Channel Configuration Program to let authorized resellers build computers based on customer specifications, diminishing the need for them to reconfigure products before customer delivery. Ron Hulse, director of channel sales and development for Compaq Canada Inc., said the program will be up and place over the coming weeks and months. "We're evolving the distribution channel to stay more competitive in the market-place."

Compaq will also be working to offer Build-To-Order capabilities to Canadian resellers, where products are actually built upon receipt of a customer order. The company says the model addresses cost efficiencies by reducing reseller's needs for on-hand inventory — lowering costs associated with product obsolescence, price protection and inventory returns. Compaq says the capability will be fully operational worldwide by the second half of 1998.

A Configure-To-Order program out of the Houston manufacturing unit, "will allow the company to more efficiently deliver customized products to Canadian resellers and customers," says Compaq.

Roger Kay, senior analyst for Framingham, Mass.-based International Data Corp., said these services are aimed to compete with companies like Dell Computer Corp. But he commented, "It's hard to have your cake and eat it too." And while channel assembly and build-to-order may be good solutions, he said some people will question the quality of the assembly. However, he said the industry will have to wait and watch as Compaq rolls out more details about the programs over the next few months.

While Compaq may be growing the direct side of its business in the U.S., Compaq Canada sells exclusively through the channels, affirmed Hulse. "There is no direct business in Canada." However, he said as security concerns over the Internet are further resolved, he expects to eventually see consideration given to increasing Compaq's direct sales, on a worldwide basis.

In 1996 in Canada, according to George Baker, manager, PC research at International Data Corp. (Canada) Ltd., Compaq held 26.5 per cent of the PC server market (13,000 units) followed by IBM with 14.4 per cent, 11.2 per cent of the total desktop market (11.47 million units) — second to IBM which owns 14.2 per cent of the market, and 11.6 per cent of the notebook market (306,000 units) — following Toshiba with 25.9 per cent and IBM with 17.6 per

cent. Looking at the server market, that adds up to 1.815 million PC systems, of which IBM has 14.8 per cent, and Compaq had 11.8 per cent.

Baker said Compaq has experienced major growth in the last few years. "They now have to move business. They're taking stock of where they were, and where they're moving towards."

The Internet

In April, Compaq demonstrated its Compaq Acceleration Server technology, which promises to speed up Internet access for corporate and home users. Users will install a browser plug-in and then designate a server (or an ISP) to be a coprocessor running the Compaq Acceleration technology as the "proxy" for the downloading of Web pages. The server technology Compaq is proposing is the ProLiant 6800/NT server integrated with compression hardware (containing at least 16 digital signal processors, up to 64) from Integrated Computing Engines and Internet software jointly developed by the two companies.

According to Richard Guerin, manager of research and development for Compaq's Internet Solutions Division, in Houston, the demonstration is just of Compaq's "Internet strategy to begin to address Internet infrastructure players." He explained the compression hardware parses the HTML and links for images. It takes GIFs or JPEGs back to their native format, and produces the equivalent of a browser that is transferred via a "wirelet," which is then reconstructed by the plug-in at the user's desktop. Guerin said he's seen images transfer up to 1,000 per cent faster using this technology.

Guerin suggested the technology would likely appear later this year.

Richard Marchewka, industry analyst and president of Microvision & Associates Inc. in Toronto, said Compaq's solution to speeding up the Web would have appeal because it doesn't require anything special of end-users. However, he said "The one flaw in the marketing premise is most ISPs in Canada don't use Windows NT as a host."

In other news, Compaq, has teamed with NetScout Corp. of Cambridge, Mass., to jointly develop a filtering specification for multi-vended services over the Internet. It includes a protocol called Mutual Services Information Exchange (MSIX) to let ISPs meter usage and charge for Internet services, such as telephony, fax, videoconferencing, content distribution and gaming.



Systems in Canada: PC Servers, Desktops And Notebooks (Q1/98 million units)

• IBM 14.4%	• Dell 5%
• Compaq 11.6%	• Toshiba 4%
• Apple 8.3%	• NEC 4.3%
• AST 3.3%	

Source: International Data Corp. (Canada) Ltd.

cent. Looking at the server market, that adds up to 1.815 million PC systems, of which IBM has 14.8 per cent, and Compaq had 11.8 per cent.

New Notebooks, Acquisition

Compaq also announced its Armada 1300 line of "value-priced" notebook computers. Starting at \$3,135, the notebooks include a 108 CD-ROM drive, a floppy drive, hard drive and modem, plus an integrated AC adapter. Features and options include a 120MHz or 133MHz Pentium processor, 16MB EDO RAM (expandable to 80MB), a 11.3-inch passive matrix or 12.1-inch active matrix display, dual battery support with a choice of Lithium-Ion or Enhanced Smart Nickel Metal Hydride, two Type II (or one Type III) PC Card slot, and a touchpad pointing device.

And Compaq has recently announced a definitive agreement to acquire Netwood, Mass.-based Microcom Inc., a maker of remote access technologies and solutions, for US\$280 million. ■

George Gassman is Editor of Canadian Computer Wholesaler. He can be reached at gass@netcom.ca.



Digital Is Back On Track With PC Business

Meanwhile, Alpha/NT systems tour rolls across Canada, in transport truck.

by Grace Courtenay

Business has been brisk at Digital Equipment of Canada Ltd., a Kanata, Ont.-based PC plant, which turns out as many as 3,000 PCs per day—a significant production count by any standards. Indeed, those kinds of numbers easily qualify the company as the largest manufacturer of personal computers in Canada.

The 300 000-square-foot Kanata facility exports \$1.6 billion worth of PCs annually. And with more than 1,300 employees in that city, Digital is not only a founding member of Silicon Valley North, the company also claims to be the third largest employer at the National Capital region following the federal government and Mordor. Another 300 employees staff a service and support centre in Hull, Que., handling more than 50,000 calls per month, with a goal to answer 70 per cent of phone calls within 30 seconds and to log or route requests within three minutes. (There are a total of more than 3,800 Digital employees in Canada, in 38 locations.)

But most impressive is the fact the company has entered its profitability, according to Jim Nolan, general manager of Digital's Personal Computer Business Unit. While the unit experienced financial losses in Q4 1996 and Q1 1997, Digital's PC Business Unit turned that around in its second quarter, and profits were also achieved in Q3 '97, which ended March 29. (The company doesn't break out figures for its individual divisions.) "The turnaround has been dramatic," he said. "The company is investing in good products, and is building for the future."

There are definitely challenges however, according to Mario Leduc, manufacturing president and business planning manager for the Kanata plant. The company runs a build-to-order manufacturing environment, and runs each \$5 million line on three shifts per day. "If you lose capacity, you can't make it

up in a 7 x 24 operation," he said.

Digital says 90 per cent of its PC business goes through reseller channels, and claims such clients as the Quebec government, TransCanada Pipeline, Stinson BC Tel, Manitoba Tel and Nortel.

Bill Harris, Digital's enterprise marketing manager, said that even for server sales, the channel is already in the field. "We insured that we stayed with the PC business."

According to a survey of servers released in February by Evans Research Corp., Digital sold 4,000 Intel-based servers in 1996, in Canada, ranking itself after Compaq and IBM and more or less tying with NEC for third server market share. However, many of those sales came from existing Digital customers moving from VAX-based to Intel-based solutions.

Meanwhile, in March Digital expanded its notebook line with the addition of the HiNote VP 500 series. The HiNote VP 500, 545 and 575 notebooks have 12.1-inch displays and incorporate a removable combination CD-ROM/Zip drive. (The key supports an optional second battery.) They come bundled with Windows NT Workstation preloaded and preconfigured, and include power management and plug-and-play features for NT. Pricing starts at \$3,795.

Digital Takes To The Road

Speaking of NT, Digital Equipment Corp. and Microsoft Corp. have teamed up to take an ill-wind on the road to show off Windows NT, Alpha servers and third-party technologies that take advantage of those

products. According to Glenn Bontje, marketing manager for enterprise servers with Digital's Systems Business Unit, based in Calgary, the Driving Force Tour will visit 34 North American cities over 20 weeks. The tour is in Montreal on May 28, Ottawa on May 29 and 30, and Toronto on June 2 and 3.

At the Calgary stop, Bontje said: "The key message is Digital is providing leadership technology and leadership partnerships in NT solutions. We said NT solutions on Alpha systems are replacing mainframe servers, while reducing costs for organizations."

A recent Deloitte and Touche report called "Technical Workstation Total Cost of Ownership Study: A Cost Comparison of Microsoft Windows NT Workstation and Unix," said the average three-year total cost of ownership (TCO) for technical workstations running Windows NT Workstation (Windows NTW) was US\$60,000 versus US\$104,000 for comparable Unix machines—a savings of 39 per cent.

Philip Doolittle, president and CEO of Calgary-based systems integrator Chronoscale Systems Inc., was in attendance at the Calgary stop of the Driving Force Tour. His company works to "leverage the productivity of the knowledge worker, specializing in corporate messaging and mail, intranet/intranet security, groupware and data warehousing. He said the company is currently working with Digital on a 3,500-seat implementation of Exchange running on an NT backbone.

Doolittle said customers have a choice of a variety of hardware, platform and operating systems. "Our role is to take away the pain from customers and understand the range and complexity of the offerings." ■

Grace Courtenay is Editor of Canadian Computer Wholesaler and can be reached at grace@wincom.ca.



Digital's Alpha line manufacturing tool set in an 80 000-watt facility.





Java Phenomenon Hard To Ignore

Sun's new announcements:

Personal Java API — aimed at TV set-top boxes and WebTV sets, smart phones and hand-held computers.

Embedded Java API — for use on display-limited devices like pagers or fax machines.

Java Studio — brings Java authoring to the rest of us.

Like the warm brown beverage that joins morning meals to across all parts of the world, Java — the technology phenomenon, has seized the attention of the computer industry worldwide.

The dictionary defines a phenomenon as a remarkable occurrence, and Java is that, if nothing else. Java, like the word "computing," itself, refers to many things. It is a hardware platform, a programming language, a set of software components, applications, a corporate strategy, a new architecture for the Internet and corporate intranets — and perhaps even a new religion. It's a perfect expansion of "Sun Microsystems' unofficial slogan "The network is the computer."

There are 300,000 programmers writing Java code today, according to Sun. A few companies are actually using internally developed Java applications in critical business applications. Microsoft Java has the wholehearted support of some of the industry's biggest players including IBM, Oracle Networks Communications, Novell and Sun itself. Sun CEO Scott McNealy boasts of how quickly this has happened — about two years — and it's entered an environment worth creating about.

But What's The Big Deal?

When achieving was fashionable, the most spoken words for the universal solvent and a way of turning dreams into gold. Sun is looking to create gold by proposing the universal programming solution. When Sun, Netscape, IBM and Microsoft sponsored a multi-city Java World '94 event earlier this year, the big theme was "write once, use anywhere." The implications of that slogan were apparent in the object-oriented programming world, which has long championed portable reusable software components. C++ has been

the preeminent object-oriented programming language for some years now. Java is often referred to as a "C++-like" language — and often treated as a more refined one.

Java programming is compiled as bytecode files and that's what contributes to its "write once, run anywhere" portability. Programming code is usually compiled into platform-specific executable files, but the bytecode file runs a platform-specific. The same bytecode can be used across all platforms, from Unix workstations to PCs to the rising thin-client network computers.

What is specific to each platform is the Java Virtual Machine, which executes the bytecode. Separate VMs have to be created for every platform in order for Java to run there.

Java programmers can wrap stand-alone Java application or applets. The latter are usually embedded within a Web document, and are executed by a Java-enabled browser. Applets were most people's first exposure to Java, as the downloadable editor and scientific stock market tickers made their mark as the tops of the Web amongst Web surfers.

Cord Corp. was the first company to announce a full-blown commercial application written in Java — the WordPerfect Office suite. The company now has the official beta version of the suite available for downloading on its Web site. I downloaded a pre-official beta version of the suite a week or so before the official beta was posted, and played with it for a bit. Only the WordPerfect and Quattro Pro modules were working, but I was surprised at how responsive it was, because I'd heard reports some months back that it was dog slow. Some of the performance success might be attributable to the VM, which Sun is trying to make faster and faster.

But it's not about optimizing the PC environment. While the Java version of Cord WordPerfect Suite is a significant project, Java isn't just another way of bringing applications to the PC — or extending the metaphor of the PC to the only personal computing device, for



by David Threlkoff

that master Pro-where was that message more clear than at the Sun-sponsored JavaOne developers' conference, held in San Francisco in early April.

JavaOne Conference

There, Sun announced a number of initiatives that work to make Java an every corner of the computing universe.

For example, Sun announced the PersonalJava and EmbeddedJava Applications Programming Interfaces in a news release. Sun stated that these, along with a Java Card API announced last October, provide "a one find way for programmers to create applications that run on phones, pagers, hand-held computers, printers, copiers, industrial controllers and smart cards."

Among the target devices Sun lists: for the PersonalJava API are TV set-top boxes and WebTV sets, smart phones and handheld computers. The EmbeddedJava API is for developers that want to use Java on display-limited devices like pagers or fax machines. The spec. directions for these will be finalized later this year.

Sun and it's also making Java accessible to non-programmers with the Java Studio, which it also announced at JavaOne. Sun calls it a "tool for the rest of us" and Java Studio includes a graphical HTML authoring tool, a Visual Java assembly tool, and a set of 35 JavaBeans, which are reusable software components.

These include controls for building user interfaces, for viewing information, accessing data, and multimedia components (image viewers and audio players). Sun says an early adopters' version of JavaStudio will be available for download in June. ☐

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The Might Have Beens

The technology business is full of examples of products and companies that apparently came out of nowhere, flourished, and then just as quickly have gone from being mightily impressive to abject failures. How can resellers avoid tying their fortunes to a failure?



All resellers dream of getting in on the ground floor of the Next Big Thing — that new technology market, product, service, or gadget that is going to make megabucks. Get in early, while there is a good profit to be made and prime clients to be won, and get out early, before markets or product lines that are about to decline.

No reseller or distributor wants to be stuck with inventory that will have to be discounted or discarded in order to be shipped out. So how do you pick the winners and avoid being dragged down by the losers?

Commodore

Commodore Business Machines, which was founded in Canada, grew from a little business equipment sales and repair shop on Davenport Rd. in Toronto, to a global personal computer giant that sold about 20 million computers — and then collapsed in confusion in 1984. Commodore's greatest success was the Commodore 64, an inexpensive, versatile, and by the standards of the early 1980s, easy-to-use personal computer. "I Adore My 64" was the brilliant slogan on the lips of a whole generation of first-time computer users. Resellers who got on the C64 bandwagon early switched product fly-off the shelves quickly and at good profit margins.

However, Commodore management, after a great start, began to believe its own PR, became arrogant, and lost sight of long-term business realities. Commodore alienated its dealer channels by forcing resellers to take shipments of unwanted, unpopular Commodore products if they wanted to get shipments of the scarce, highly priced C64s.

Commodore counted on the fact that the loyalty it had earned from resellers, and end users in the early years would offset its poor practices later on. And, for a long time, some of the good times and the good profits kept Commodore's resellers on-side. As one of Commodore's top Canadian dealers put it when describing what it was like to deal with Commodore, "We always knew there was crap on the floor, we just tried not to step in it."

In the fall of 1983, however, with the

Commodore product line having become chaotic and overpriced, the company's creditors, decided to stop extending credit to the company, and Commodore quickly found that it had alienated all its former friends. It had run out of time and money to re-engineer the company or even to continue to build computers. It then went into a death spiral that ended with liquidation in April 1984. Thousands of dealers, third-party developers and customers, not to mention millions of end users, were left holding the bag.

Big Blue: From Behemoth To Bungler, To Behemoth

IBM, which benefited from the widespread belief that "Nobody ever got fired for buying IBM" staggered in the late '80s and early '90s by not adapting to the rapidly changing computer market it had dominated for the previous 20 years. Like Commodore, IBM tried to market itself from customers and market analysts. Previously, technology leader IBM had hobbled some of its best new technologies (such as RISC workstations) for fear of competing with higher priced "big iron" computers. IBM had also tried to push products on the market that it didn't want (such as the PC clone), and the proprietary Micro Channel architecture, and had developed a bad reputation among its resellers for allowing its in-house sales force to snoop sales leads generated by its outside business partners. Unlike Commodore though, when IBM ran into its troubles it found that it still had lots of friends (in the form of customer and business customers), a reputation for quality, and a depth of technological and human assets that gave it the means to get out of its troubles.

Under an exceptional new leader, Lou Gerstner, IBM reformed itself quickly, and thought it will never have the same down side it once enjoyed, is once again a healthy, major player. Dealers who stuck with IBM, in general, made a good choice.

Xerox

First, Xerox Corp. misread most of the key components needed for its initiative entry to

the personal computer, the graphical user interface, windows, icons and pointing devices.

Xerox senior management didn't understand that brilliant invention could have made Xerox the leader of a whole new personal computing industry. They were fixated on accounting on a single-purpose, expensive, specialized corporate word processing system instead of mass market, flexible PCs. Fortunately for the rest of the world, Xerox failed to patent its best ideas, and let Apple's Steve Jobs' steal through their lab to use and "improve" these concepts.

Apple

Apple insisted on being the only company allowed to use its own wonderful Mac OS technology. If you wanted to use the Apple operating system, you had to buy the hardware to run it on from Apple, and only from Apple. This left Apple fairly vulnerable to smarter, less intrusive-minded competitors.

Microsoft's Bill Gates, was left free to learn from the Mac (Microsoft has generally been the biggest Mac software developer) and apply its lessons to the much bigger IBM-compatible PC market.

If Steve Jobs had had the foresight to think of the "Mac as PC" idea and act on it, he might today be the world's richest man. As it is, Apple is doing a dance somewhere between the Commodore Death Spiral and The IBM Stumble. Apple is in an very serious trouble, but it still retains a lot of customer loyalty, some decent products, and a reasonably strong dealer base.

The Next Big Thing

Have a real good look at your partners' current products, their business practices and their R&D directions and budgets. If you see fundamental divergences for sound business practices and divergences for market demands, be prepared to cut your losses and quickly find alternative products to sell. ■

Jeff Evans is Associate Editor of Canadian Computer Wholesaler based in Toronto. He can be reached at jef@ccw.com



by Jeff Evans

Nifty Numbers

DESKTOP VIDEOCONFERENCING MARKET

Home Videoconferencing Will Boom, Says Study

(NR) — Desktop videoconferencing will grow sharply over the next four years, and the home market will account for the lion's share of that growth, according to a new study by International Data Corp.

Businesses have been the first into desktop videoconferencing, but now today almost as many homes as business users are buying desktop videoconferencing gear, according to IDC's figures. Between now and 2001, the research firm expects annual business shipments to slightly more than double, but predicts home videoconferencing shipments will increase more than 20-fold.



Purchases of desktop videoconferencing units in 1997:



IDC's report, "Desktop Videoconferencing: Audio/Visual Collaboration Via the PC," says business customers will buy about 200,000 desktop videoconferencing units this year while home customers will buy about 250,000.

Edward Buckingham, an IDC analyst, said the home sales could include some people who have desktop videoconferencing at home but use it mainly for business purposes. But he said the equipment is also being used to keep in touch with distant relatives and for other non-business purposes.

Some senior citizens' centres are installing videoconferencing, so seniors can conduct videoconferencing visits with children and grandchildren over long distances, Buckingham noted.

In 2001, IDC expects about 600,000 desktop videoconferencing units to ship to business customers, and some \$4 million to sell into the home market.

Buckingham and IDC gathered its figures by talking to videoconferencing vendors, not by surveying users, and so has little data about the personal uses to which people are

putting their videoconferencing gear. IDC said desktop videoconferencing is taking off because the equipment is getting better and cheaper — a consumer system can be had for US\$400 to US\$900, Buckingham said — standards efforts are making it easier for different vendors' equipment to work together, and new video and graphics chips and compression techniques are boosting performance.

The latest desktop videoconferencing products are going beyond point-to-point conferencing, into one multi-point, multi-media videoconferencing, IDC said.

Canadian Government IT Spending

1996: \$3.7 billion

Overall Market Growth: 6%

Spending Breakdown By Sector

Decom: \$ 0.14 billion

Hardware: \$1.2 billion

Software: \$0.65 billion

Services: \$1.7 billion

IT Spending Breakdown, By Government

Federal: 60%

Provincial: 30%

Municipal: 10%

Source: International Data Corp. (Canada) Ltd., 1996

VOICE YOUR OPINION

Reader Poll

A number of computer manufacturers (Compaq, IBM, Dell, etc.) have adopted or are moving to business models which will allow end-users and/or resellers to order "custom" computers — with specific component/configuration choices.

And Compaq plans to allow more resellers to actually undertake that configuration, promising the result will be better service to customers, and less hand-to-hand product in the channels.

But how do YOU feel?

Our question to you:

Which most closely reflects your view of the custom configuration issue?

- ☐ We would like to see vendors or distributors set up to allow us to order very specific custom configurations on behalf of our customers.
- ☐ We currently do — or hope to be able to — offer very flexible custom configuration services ourselves to our customers. We prefer to do that configuration work in-house.
- ☐ As long as the vendors offer a broad enough range of systems in their product lines, that should meet our needs and those of our customers. We can undertake minor configurations/ customizations as necessary.

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Move Slowly Towards

High-Speed 56Kbps Technology

by Dan McLean

A few words of advice for those considering a jump up to super-quick 56Kbps high-speed modem technologies — not so fast.

Making the move to this next generation of Internet connectivity is still a risky proposition and making a choice today could mean a bigger headache tomorrow, if the 56Kbps modem technology you choose to support doesn't emerge as the industry standard.

Internet service providers are especially wary, since those want to be in a position of having to refresh their wiring closets more than once, so they are apt to delay full and wide-scale implementation.

Many experts are advising modems and consumers to wait for the dust to clear. "If you're a large corporate user you probably should delay your decision to buy more modems until the standard is set," said Allen Gernsaw of International Data Corp. in Framingham, Mass. "If you're an ISP to go with a pre-standard technology [means making sure it's software-upgradeable because you don't want to have to go into your wiring closet any more times than you have to]."

Whether it's U.S. Robotics Corp.'s X2 or Rockwell Semiconductor Systems/Alcatel Technologies/Motorola Inc.'s K56flex, take comfort in the fact that purchasing either won't mean buying a potentially useless technology. When a 56Kbps modem standard is finally introduced out, both will ultimately be made compatible by their respective makers, according to Gernsaw.

Both technologies work basically the same, employing a software-based modulation scheme he said. There are slight differences in the software coding that currently makes X2 and K56flex non-compatible and each modem maker, "simply has to agree that the technologies will speak to one another."

K56flex is the more widely adapted of the two technologies among vendors, with support coming from the likes of AST Computer, Compaq Computer Corp.,

Hewlett-Packard Corp. and Toshiba Corp.

According to Backwell, it's K56flex will offer speeds up to 54Kbps, without requiring the installation of new phone lines. The company argues most central city modem centers, already use Backwell chapters and more than 300 of them have already pledged their support for K56flex.

The more proprietary X2 technology from U.S. Robotics has the advantage of being first to market with available product. X2 technology, introduced in early March, is a software download (US\$999) for Courier modems and a chip upgrade (US\$499) for Sportster modems.

Trinh told Gernsaw said users can initially expect speeds in the 40Kbps range.

A number of ISPs have already announced their support for the U.S. Robotics technology. According to Allen White, Canadian district manager for U.S. Robotics, that list currently includes Symphonix, Netcom Canada, AOL Canada, Star and TotalNet. At press time the modem maker was also negotiating with HookUp Communications. "We have a program for Internet service providers to help get them upgraded to X2 and to provide some co-marketing funds for them to help really push the fact that they have X2," White said.

White admitted user confusion abounds, but predicted those same users are willing to buy into the U.S. Robotics technology because of the company's huge installed base. "Absolutely there is confusion in the marketplace now. There's not as much as there could be because we're the only one shipping a (56Kbps modem) product today (on product)," he said. "We dominate the marketplace here in Canada. For sales out of distribution for 23.8 and above desktop and external modems, we control a 63 per cent market share here in Canada, and for PC Card modems, we control a 91 per cent market share. "Most people are jumping on the X2

bandwagon," White added. "When the pressure really lies is with the service providers, because the service providers will sit back and say, 'Yeah, 65 per cent of my [users] are using U.S. Robotics so I'll have to support X2. But then I'm turning my back on the other 35 per cent.' So I think the pressure is really going to be on the service providers to support both standards."

Recently three others entered the 56Kbps product fray. Hayes Microcomputer offers an upgrade program for any vendor's modem to Hayes 56Kbps Access modems — for US\$599. Bay Networks Inc. will provide a free 56Kbps technology upgrade for its BayDSP Integrated Digital Signal Processing modem in its current-class 3399Kbps Access Concentrator Module for the 5600 MSX Multi Service Switch.

Most recently, in Oakville, Ont.-based Global Village Communications announced the availability in May of 56Kbps Motorola modems which support both K56flex and X2 technology, called Teleport 56. The street price for those products is \$399.

It is on the server side where Backwell may have the edge. K56flex has the support of two giant chip makers and an approximately 70 per cent share of the installed server line base in North America.

Hayes and its partners are also members of the OpenV8K forum, a group of vendors who have come together in an attempt to settle the 56Kbps standards issue. That group planned to hold its first meeting on April 23 in New York.

The Telecommunications Industry Association, the organization that will set the standards, has a timetable of June for a decision, but many, including Gernsaw expect it will be somewhat next year before a 56Kbps standard emerges. □

Dan McLean is a Toronto-based journalist who specializes in high technology reporting.

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Preparing For The Printer Market In

by Jeff Evans



1997

The average printer, whether a \$300 desktop ink-jet model, or a \$10,000 network laser, is increasingly a user-friendly appliance that has amazingly sophisticated technology buried inside it.

Photo: iStockphoto.com/Photo: iStockphoto.com/Photo: iStockphoto.com

I remember the first four printers my wife and I bought for our fledgling desktop publishing company, in 1983 and 1985. One was a tiny \$700 Hewlett-Packard ThinkJet—an early monochrome ink-jet that printed out angular “computerish” letters built up from a small number of dots, with about 70 dots per inch (dpi) resolution. We also got a Canon #3 1080A color ink-jet, with a list price of about \$800, and offering 84 dpi resolution. We added a \$60,000 Linotype PostScript imagecaster, to which we could hook up our MS-DOS PCs. Macs and Averages to print out typeset text on film at up to 2,400 dpi. Shortly after that, we added an \$6,000 300-dpi Apple LaserWriter as a proofing device for plain paper output.

In 1997, many of the features of those four early printers are available in the average computer user, confined on one desktop printer with higher quality and more flexibility for a few hundred dollars. In particular, “photo quality” ink-jet printing of both text and images far superior to anything on the market in 1983: at resolutions up to 1,440 dpi, is now available in the retail market. Meanwhile, fast 600 dpi monochrome printing via networks is a fixture in businesses and government agencies. Far from creating a “paperless office,” the new generation of printing technology is causing an increasing flood of locally generated documents, and creating a new, multi-billion dollar market for printing supplies for Canadian retailers.

According to an Evans Research study of the Canadian printer market, unit sales of printers, especially ink-jets, are up sharply, and ink-jet printer sales in Canada will continue to grow strongly for the next few years.

According to Evans Research, inkjet printer unit sales in Canada will jump from 475,000 in 1995 to 1,036,000 in 1997. At the same time, though, total dollar revenue on those sales will only increase marginally, from \$254 million to \$266 million. In other words, as sales soar, price-per-unit will plummet, and so will reseller margins. Profits from the ink-jet market will have to be wrung almost entirely from the supplies market, as resellers offer ink and toner cartridges, paper and other add-on products to make a profit. This continued growth in inkjet sales will come partly from new customers, and partly at the expense of laser printer sales, which are

expected to fall from the current 610,000 to 443,000.

The Razor Blade Industry

Prices on some printer hardware has dropped to such a low level, according to Evans Research, that in many cases printers are regarded as “used” products—the margins for manufacturers and resellers are minimal, but once the hardware has been sold, the opportunity for profit comes in the follow-on sales of toner or ink, paper, and other add-ons. This follows the model established a century ago in the shaving industry: safety razor holders were sold for next to nothing, and fortunes were then made selling the packs of disposable razor blades that were needed to enable the casual shaver to take place.

To an increasing degree, the printer market is seeing the same dynamics taking hold. In 1996, dollar sales of ink-jet printer supplies exceeded dollar sales of ink-jet hardware for the first time. By 1999, supply sales are predicted to hit as much as \$2 billion, well over twice the value of printer sales in that year. The profit opportunity for resellers, it would seem, is in the “razor blades”—the consumables that make the shaver work for the end-user.

Technology Drives The Race

The average printer, whether a \$300 desktop ink-jet model or a \$10,000 network laser, is increasingly a user-friendly appliance that has amazingly sophisticated technology buried inside it. Printers do something that personal computers don't: they manufacture a physical product rather than simply move electronic data around. Printers take in paper or other media, and then arrange patterns of toner particles, liquid ink droplets, molten wax, or colored vapors on the media as it passes through the printer. Especially in the case of color printing, the process involves manipulation of matter and energy at a molecular level, employing fundamental physical processes that were simply unavailable to human manipulation until recently. Up to several million microscopic droplets are precisely positioned every second in order to create a picture of a schoolkid's pet cat, or a picture chart for a business presentation. The big players in the printer market: Hewlett-Packard, Epson, Canon and Lexmark—are spending billions of dollars each year in research, which is the principle reason for the rapid evolution of the products we see on store shelves. The money required to stay on the leading edge and remain competitive also means that printer manufacturing is increasingly a game for the big boys.



continued growth in inkjet sales will come partly from new customers, and partly at the expense of laser printer sales, which are

Generic Versus Brandname Supplies

In many ways, for resellers the "real" part of the printer market (the part that offers profit opportunities) lies in selling supplies to printer users after they have bought the printer hardware.

The question of whether printer owners should buy name-brand toner or ink or use generic manufacturers' products is a source of endless controversy. In the early days of non-name-brand supplies, there were instances of fly-by-night cartridge refillers who sold poor quality products, which performed poorly and could void the printer's warranty by causing damage to the printer. Most of the non-name-brand suppliers still in business supply good quality products, at prices so much below those of name-brand supplies that many printer owners are happy to use them. For example, Image Control Corp., a Scarborough, Ont.-based supplier of remanufactured, second-hand and generic supplies for lasers and ink-jets claims to have more than 3,000 different products available. D.M. Agency of New Jersey sells a do-it-yourself refilling system, called the ReInk system, which employs bottles of ink with flexible tips for refilling cartridges. ReInk has now been available for a range of printers, including Canon, Apple, HP and Tektronix. In past years, some printer manufacturers got into heavy-duty conflicts with consumers by threatening to void printer warranties if they detected evidence of use of non-name-brand supplies to printers returned for servicing. Nowadays, although printer manufacturers still don't like finding strangers' cartridges in their printers when they come in for service, they are more diplomatic about honoring warranties. Representatives from HP and Canon pointed out that vast amounts of R&D money (over half a billion dollars per

Winners And Losers

Resellers have very little tolerance these days for getting stuck with obsolete products which have to be locked out the door at sacrifice prices and will move to new product lines that are selling. The result has been tough times for printer makers who labor in terms of price/performance.

In particular, the low-end laser printer market has suffered from apparently inevitable competition of color ink-jets. Although there is still a business case to be made for a personal laser, particularly in a home office, consumers are in love with the current generation of color ink-jets, and that is where the bulk of the market currently lies.

QMS, a pioneering PostScript laser printer maker which has a well-earned reputation for quality, took some serious hits when laser printer prices dropped suddenly a few years ago, putting its monochrome laser printers at a disadvantage. When low-cost but high-quality color ink-jets challenged its excellent but pricey color thermal transfer printers, it suffered similar setbacks. The company was forced to concentrate on markets where it still had a convincing story to tell (especially in high-quality newspaper business editions), and a hard to reverse its technology and product offerings. It appears to have accomplished an admirable turnaround, but it seems to be out of the personal laser market, once for all.

When caught in a no-win situation, particularly in the cutthroat low-end printer market, other manufacturers have responded as QMS did, by moving to niche markets or to the corporate networked printer market, where margins are still higher, and professional customers are looking for printing solutions and long-term stability and service. So, for example, Lexmark exited the low-end personal laser printer market (though maintaining its successful personal ink-jet line), and now concentrates on its Optix laser and its NetWorx network printing solutions. This corporate focus allows Lexmark to offer professional documents solutions for super-price ranging from small offices to large corporations. Similarly, companies such as Graphics and Tektronix have attempted to stake out chunks on niches within the government and corporate markets offering high-end document solutions.

The major entry printer makers in the Canadian market are a handful of giant companies: Hewlett-Packard, Epson, Canon and Lexmark. They have released a constant stream of new products in late 1996 and 1997, and Epson in particular seems to be

ramping in terms of retail marketshare. In the case of the retail ink-jet market, the number of printers sold is rising so fast there is some room for all the players to grow. The crunch may come in a few years when the market is saturated, and the surviving printer makers have to fight over a stable or declining pie.

Apple

These days, it's easy for retailers who don't handle Mac computers to forget that Apple even sells printers, but at one time it was a leading player in the laser printer market with its LaserWriter line, and it has also been a leader in color ink-jet products. The LaserWriter offered great ease of use, connectivity and PostScript compatibility, but it was often the most expensive product in its class. This made it a target for all other manufacturers to lease their designs on, and to aim to displace. The individual products are quite impressive. The Color StyleWriter 2300 is a nicely designed, compact, light, portable ink-jet, ideal for students and PowerBook users. The Color LaserWriter 2360 P3 is a sophisticated, leading-edge color laser, with plug-and-play networking support and ColorSync color matching technology, and the LaserWriter 1264G is a fast, multi-platform compatible device with excellent work-group performance. After a brief period of success with LaserWriter sales into the MS-DOS/Windows market, Apple's printer offerings have pretty much been confined to Mac companion sales — a shrinking market which offers less revenue to finance new research and development.

Apple Color LaserWriter 2360



Brother

The Montreal-based branch of the Japanese multinational distributes a wide range of laser printers, faxes, multifunction (fax/copier/scanner) and special-purpose printing devices across the country. In business, Brother's laser printers have scored high for price/performance, though like all laser makers, Brother's personal laser line has suffered from competition with low-cost ink-jets. The company has a wide enough product line, but it still has strong sales in the other printing product categories.

Canon

Canon Canada is perhaps the most visible giant of the Canadian printer suppliers. Compared to the amount of attention Hewlett-Packard, Epson and Lexmark have recently been given by the computer press, one might think that Canon is a smaller presence in the market. The reverse is true. Canon, in addition to supplying huge numbers of fax machines, copiers and laser printers, is the number one vendor of ink-jets in Canada, according to the recent *Ennis Research* survey. However, a great survey of Canon's ink-jet products points obscure parts of the business printer market, such as point-of-sale printers. Many of Canon's printers are also non-ink-jet (but still useful) black-and-white models. However, with the recent release of the BJC-4300 color ink-jet, Canon has a product that competes head-to-head with the latest Hewlett-Packard, Epson and Lexmark models. With its optional photo cartridge, it produces excellent photo-quality output.

Epson

Epson was once the leader in dot-matrix printing, and when ink-jet printers and personal laser sales began to take off six or seven years ago, the company was perhaps too slow to concentrate on those other printing technologies. As a result, Epson saw its competitors leap ahead in market share. The company struck back with the Epson Stylus Color about three years ago, and that printer's 720 dpi, near-photo-quality output, took the printer market by surprise. The original Color Stylus had one big drawback, which was a dependence on very expensive coated stock. Since then, however, Epson has released new Stylus Color models that have continued to boost performance while offering excellent, cheap "plain paper" output. With the release of its Epson Stylus Color 800 model, Epson Canada Ltd. began to

increase its marketshare rapidly in the retail ink-jet market, and has followed up that success with the release of three new Stylus Color models, the budget-priced 400; midrange 600, and professional-level 800 models of Stylus Color. Epson has upped the ante in personal ink-jet printing resolutions with its Micro Piezo printing technology, which enables up to 1,440 dpi printing. The additive eye candy that these color printers are capable of creating has created something of a bonanza for resellers of Epson printer supplies. According to market analysts, Epson is continuing to expand its market share rapidly in 1997.

Fujitsu

Fujitsu Canada carries a number of mainly high-end, specialized dot-matrix and laser products, named as business solutions. The FreePartner 100V and 144V Workgroup lasers are high performance printers intended for demanding office environments. The company formerly sold lower-end lasers, which it de-emphasized as the competition in that market became more intense.

Hewlett-Packard

Hewlett-Packard (Canada) Ltd. is the giant of Canadian printer suppliers, in terms of both volume of sales and range of products. The printer line of HP is only one component of a larger technology company with revenues of more than US\$15 billion per year. HP is a leader in networked high-volume laser printers, personal laser printers, multifunction devices, and ink-jet printers. HP tends to offer PostScript models of most of its laser printers, as well as nicely engineered networking options for its midrange and low-end lasers. It is a major innovator in printing technology, and sets the pace for the other major companies. HP has seen serious competition from Epson and Lexmark in the color ink-jet market, as both these companies have specifically targeted HP as the competitor to beat.

HP's sales earnings and profits increased substantially in the first quarter of 1997, with orders for HP LaserJet growing moderately, and orders for the HP LaserJet 6P showing good market acceptance. Demand was high for both the new HP Color LaserJet, and sales of printer supplies. HP claimed healthy growth in ink-jet sales, but margins on these products were squeezed by the ongoing drop in ink-jet hardware prices.

year, in the case of HP, go into developing improved ink formulations, cartridge and print head technology, while non-ink-jet brands companies have concentrated heavily in research. Ongoing improvements in cartridges are introduced without announcement by many manufacturers, leading to a constant improvement in quality and reduction in price of the same brand supplies. Nevertheless, for the price-sensitive consumer, there is a considerable temptation to save a lot of money by going the no-name supply route. Sometimes less controversial is the practice of buying third-party paper supplies. Mitsubishi, Dai-Nippon Ink and Co. and other suppliers have no-ink-jet presentation folders, name badges and other custom documents from a wide variety of ink-jet and laser printers. On the one hand there is a lot to be said for the reputation for quality of companies like HP or Canon. On the other hand, printer suppliers are expected to increase in sales to about \$2 billion in Canada by 1999. That's a great opportunity for resellers, but end-users can't be blamed if they want to minimize their personal costs linked to this impressive statistic.

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HP LaserJet 6P

HP continued to be a technology leader with the introduction of its OfficeJet Pro 100c, a color printer-copier-scanner which combined two of HP's leading technologies, color ink-jets and e-scanners. Its Desktop 942C photo quality printer, named as the SOHO market with a street price under \$500, is highly competitive with any other offerings by other manufacturers.

Lexmark

Formerly a division of IBM, Lexmark was spun off as a separate company several years ago during IBM's time of troubles, and it has proven to be a success as an independent manufacturer outside of the embrace of Big Blue. Its core products are the Optix line of laser printers, MarkVision printer networking software, and Color Jet printer personal ink-jets. A very rare line of personal lasers was defunct nearly two years ago, due to the conviction that this product segment would be a poor prospect for success and profits, due to falling prices and competition from ink-jets in the SOHO market. Although Optix lasers are aimed mainly at networked business markets, the entry level models offer excellent performance at an attractive price, and have been cited in recent articles aimed at SOHO customers. Lexmark recently unveiled three new JetPrinter models, the 3020, 3070 and 3070. These are aimed at the SOHO market and like comparable HP, Epson and Canon products, offer photo-realistic print capability and come bundled with good selections of software to provide a complete printing solution to the family or home office.

Okidata

Okidata, a division of OKI America Inc., is an entry-level traditional printer maker, which will offer a line of dot matrix printers (including air-vent, high performance Microline 380091 Turbo), as well as ink-jets, fax machines, and its new LED Page Printers. Its LED printers have performance characteristics similar to lasers, although they use a different imaging technology. The 4W offers good laser performance at an extremely low price, and the 16 N offers 16 ppm per minute printing for a \$1,500 street price.

QMS

This company was quick to exploit the demand for high-quality PostScript laser printers created by the advent of desktop publishing (initially on the Mac, and later on the MS-DOS/Windows PC platform). QMS reached a good deal of business from Apple's LaserWriter line, by offering comparable performance at a lower price. When its personal laser printers were undercut by the drop in

laser prices to \$600 or less, QMS re-oriented its efforts to concentrate on the corporate printing solutions market. Among its current offerings are the CrownJet Print Utility for Windows, a variety of connectivity solutions such as the i-Data Jet PrintServer, the QMS Image Server Print Systems and Developers Kit, and the CrownImage Imaging System.

Current printer products include the QMS 4060 Print System, a high-speed (up to 40 page per minute) work-horse, and the innovative QMS ColorScript 440 and 460 Dye Sublimation Color printers. The ColorScript printers use a fast RISC processor to produce photo-quality output up to wide tabloid size, with sophisticated color matching capabilities, including support for Apple ColorSync, Postscript, and CIE International Color Standards.

QMS makes a distinction between 'network printing and workgroup printing. For reasons of security, it is usually preferable to locate a printer close to the user's computer, and QMS supports low-cost distributed 'serverless' setups as well as centralized network installations. Typically, QMS continues to supply extremely well-engineered, high performance printing solutions for professional users, with an emphasis on a thorough spectrum of connectivity options and compatibility with other manufacturers' current hardware and software.

Servicegraphics/Raven

Canadian vendor Servicegraphics controls the Raven printer line in Canada, which consists of narrow and wide carriage dot-matrix printers (optimized mainly to special applications such as printing on multi-page forms) and a line of personal laser printers and a dye-sublimation color printer, the RC-100. The Raven LS Series lasers are very nicely designed, fast, compact devices optimized for Microsoft Windows and Windows 95 output, at either 600 or 1,200 dpi class resolutions. In lab tests, Raven's lasers have proven to be very economical pleasant-to-use products.

Tektronix

Tektronix is a strong player in high-quality, high performance color printing, with its Phaser line of solid-ink printers. The Phaser 600 is a wide-format color printer, that can handle paper up to 34 inches wide, for graphics, arts, advertising, scientific and engineering

applications. The Phaser line's high-powered processors allow for very fast color output around a minute for even complex pages of color images printed out by the Phaser 450.

Xerox

Unlike many other printer makers which are essentially distribution operations in Canada,



Xerox has a state-of-the-art R&D facility in Mississauga, Ont., which has developed some of the company's critical color laser technology. Runners from well-placed sources indicate that Xerox will have some major product announcements

concerning color laser products in the next month, aimed at bringing that technology to a much wider market. In terms of existing products, Xerox's printer offerings should be viewed in terms of a 'document solutions' strategy that encompasses photocopiers, faxing, networking, document servers, scanning, optical character recognition (OCR) software as well as printers. Xerox has been a leader in manufacturing devices, such as WorkCentre series of consumer multifunction scanners/fax/printers/copier products, gaining wide acceptance over the last couple of years.

The Future Of The Market

HP currently has an incredible dominance in the laser market, with 33 per cent share compared to 11 per cent for Brother (mostly low-end lasers), and 10 per cent for Lexmark (initially mid-to-high-end, networked lasers). HP will probably keep its dominant position in lasers, but it will be in a slumping market. In the ink-jet market, it seems likely that Canon's current market share of 38 per cent will shrink, as the market expands and aggressive players like HP, Epson and Lexmark expand their sales. However, the growth in the printer market's size and sales will mean more sales for all manufacturers with competitive new products. The question, however, is what profits will there be in this market?

The best suggestion to retailers is to get very, very good at merchandising and marketing your printer supplies line — that's where the real opportunity exists to ensure you only see black ink, not red, on your merchandise sheet. ☐

Jeff Evans is Associate Editor of Canadian Computer Business. He can be reached at jef@compuser.com

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Fun And Games? And Profits

The computer software entertainment business is turning out to be a source of significant revenues for some resellers. But as always, the key is understanding your customer.

by Paul Weinberg

Knew your customer. It's always the first rule of business, but the advice is especially vital in the fast-paced world of computer games retailing.

Consumers are becoming more discriminating in their purchases of games software, which according to Jeremy Logan, product manager for the Toronto-based distributor Mediascape Canada Inc., has led retailers to release about a quarter of the titles they used to introduce. He estimates that the Canadian games software market in 1996 comprises about six per cent of the U.S. market, which hovered at about US\$2.5 billion.

And games retailers definitely need to know their market. "Seventy-five per cent of the sales are in the first week. There are few perennial bestsellers. You can buy 50 titles and it is like a crapshoot because you could be sitting around with 49 of them on the shelf," says Ben Bailein, public relations manager for the Toronto-based Ingram Micro Inc. (Canada).

Consider Mediascape

The appearance of Mediascape, a games software store, amidst the traditional groups on Yonge Street in downtown Toronto may be a sign that this little shop is finally seeing better days.

Owners Darren Keyes and Jon Walsh, two young men who also fit the demographic of much of their clientele, say that their location brings them cheek-and-jowl with the lucrative student of university-age students, with the proximity of some major schools nearby: Ryerson and the University of Toronto, as well as the community colleges. Both Walsh and Keyes (who are, incidentally, cousins) have earned university degrees.

So for their efforts are paying off. Mediascape is already earning a small profit after a year-and-a-half in operation.

"Their only reason for success is that there is no FutureShop around in the downtown area competing with them," says one distributor, and it may be partially true.

But Keyes and Walsh also suggest they have benefited with the gaming clientele as a matter that would be responsible for a larger retail emphasis. Both are ardent gamers themselves — each spent 50 hours on Diablo, a role-playing, dungeon and dragon game from CUCADesigners, when it came out in January — and they know at least 60 of their cus-

tomers on a first-name basis. In addition to selling games titles, several PCs have been stationed in the back of the store where people for a few one-hour play alone or compete in a networked environment.

Customers come from all walks of life. Keyes and Walsh report, from the taxi cabbies who come by Mediascape every week for his latest software; fits to the police officers who have a preference for combat simulators. Women are rarely seen in the store, even though some of the top winners of games software are female, says Walsh, who blames this oversight in the industry on the aggressive, competitive nature of most games. His partner Keyes chips in and suggests that "hooking around the street like a woman is also a girl's hobby" and that we will see more purchases by female customers.

Titles like 'Warrior's Backcloth', 'Satan's 2', 'Blast Raiders', and 'Command & Conquer Red Alert' are among the top sellers. Listed last March by Mediascape Canada is major PC games distributor.

When asked the violence and mayhem depicted in some games?

Keyes shrugs and says: "It's pure entertainment, no different from watching *X-Files* or *NY19* like on television. It's like any form of art."

There are different games categories, which sometimes blend into each other — action/adventure, strategy, role playing and sports (including hockey) — and each one attracts its own separate clientele. "Adventure games usually appeal to people who are not real gamers, while strategy is more popular among hard-core gamers," says Keyes.

Mediascape's Top 10 Entertainment Titles (March)

Product Description	CommCode	Vendor
MASTER OF ORDS II: ANITA	CO008	Spectrum Holobyte
CONAN & CONO RED ALERT	CO008	Vigra Interactive
MAGIC THE GATHERING	CO006	Spectrum Holobyte
DRAGON	CO006	Compton & Associates
SCREAMER II	CO006	Vigra Interactive
JUR ASSASSIN I	CO006	Interactive Magic
DAVID SHAFERVAE	CO006/003 I	Descent & Associates
CONAN & CONO RED ALERT	CO008	Vigra Interactive
FLIGHT SIM 4000	CO006	Microware
MAGE ABRAMS TANK	CO006	Interactive Magic

As the stars a fairly solitary activity, games software is becoming increasing social, with the growth in popularity of on-line Internet gaming where you can play with hundreds of people anywhere in the world. "Being by yourself in a room killing computer enemies over and over again is not as exciting," says Keyes.

Wahl and Keyes have bigger plans beyond the single store, differentiating poorly opening new outlets in the greater Toronto area or eventually drifting into other aspects of the entertainment business. "We don't want to be two 40-year-old guys still working in retail," nation Wahl.

"You can buy 50 titles and it is bit of a crapshoot because you could be sitting around with 49 of them on the shelf."

— Ben Hardison

Keyes who has a masters degree in physics, jokes about how he decided to go into business rather than make weapons.

On the market in general, he commented "Retailers do appreciate the value of the games market, but they don't know how to run it. I think most of them have gotten into the games market a little bit at some point and then backed out."

The Market

Logan made reference to one large retailer in Canada that turned in *Demomage* for help on displaying the games titles in its various outlets. "It wasn't properly merchandising the product. No nice little signs and the shelving was poor," recalls Logan.

Nevertheless, adds Logan, a small independent operation like Mediavault has a major advantage over the large chains when it comes to games software. It can get a new title from a distributor onto a shelf, one to two days faster than a chain which has to make extra store shipping copies to all its outlet stores across the country. That is pretty important now, he explains, because hard-core gamers want the new titles as soon as possible and they are willing to pay more for that opportunity. "The first store that has a new game will get the initial sale even if it is five dollars more," says Logan.

Gaming Today

Keyes recalls creating games software when he was 17 and moved with efforts involved "two or three guys."

Now game development is no economically expensive endeavor, with games titles starting at \$3-million in some development costs, with 40 people doing the programming over a two-year period. He adds that Hollywood has climbed on board with the introduction of games versions of popular movies featuring actors like Christopher Walken and Bruce Willis.

Adds Wahl: "You really have to know the product is well ahead of time. Stay in touch with what is happening on the Internet [where versions of titles are featured] Read the gaming magazines. You know there are certain games that are going to be big. Most retailers don't have the time to invest when [games] is only part of their revenue. For us it is a major portion of our revenue."

Gaming is a subculture, Wahl reports, where gamers like to come into a store and personally check out hot titles with a knowledgeable staff.

But if there is one sector where customer service unfortunately rates quite low, it is the PC retailers, says consultant Bob Prichard, president of the Markham, Ont.-based R.J. Prichard & Associates. "Games software carries attributes of both a computer and a consumer electronics product," adds Prichard, which he says causes a lot of headaches for retailers.

Video games vendors treat their retailers a lot better than what the computer industry treats out, according to Prichard. Consumer control is centered on the pricing of games titles, compared to the PC industry "where products are undistributed and competition is solely on price," he says.

In contrast, video games retailers are given something akin to differentiating themselves from their competitors at more like market positioning. The same games product may differ from store to store for reasons.

Computer games start out being sold at somewhere between \$55 to \$70 in the retail channel, but eventually drop as low as \$49 at outlet stores. One exception is the popular Double, where pricing is being kept up, explains Keyes. There is the additional used games market where gamers will become bored and sell off their old titles, which can be resold at a reasonable amount, he adds.

Whether games software has helped create the demand for Pentium PCs is open to debate within the industry. It is safe to say that the sophisticated titles put a lot of demand on the hardware and software.

Jason MacLennan, editor of the on-line magazine, *Computerworld* (just off their cover) suggests a user needs at least a Pentium 90 to benefit from the pleasure of playing them. He is critical of games vendors that invest on more computing technology than what the customer already has available. "Many game developers are lazy and (won't) streamline the code," he.

Paul Weinberg is a Toronto-based journalist specializing in high-technology reporting and business. He can be reached at pweinber@nortel.ca

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New Wave of Client/Server Hits Market

by Paul Lene

Although the transition to client/server has not always gone smoothly, it is almost impossible to find a large-or medium-sized business that has not migrated at least in part to PC-based network computing. Even small companies with fewer than a dozen employees are networking operations, and running applications and peripherals off servers.

And while there have been bumps on the transition road, the next generation of client/server — intranets and virtual computing — is already upon us.

Corporate use of intranets is skyrocketing, according to a *ComScore Networks* Inc. survey of 32 American companies. While the mean number of internet users at the companies was 5,903 in late 1994, that number is expected to more than double this year. Companies are using the intranets primarily to share information

among employees and collaborate on projects.

Ship McCaughey, worldwide market manager, *VirtualAge*, IBM Corp., describes the virtual corporation as "an exciting new type of organization where responsibility-based people set to solve particular problems with almost a disregard for organizational boundaries." Filled by the Internet and intranets, virtual corporations will transcend departmental, company and geographic boundaries. "People down the ball will have a closer affinity to people across the continent than what they have with people next to them," he says.

With increased connectivity, customers are becoming data entry clerks for the corporation, says Judith Horwitz, founder, president and CEO of *Horwitz Group Inc.* She cites as an example, *Federal Express* customers who can log on to the *Podia* tracking system and look up the whereabouts of their packages. "Systems are as much an issue for the customer as they are for the internal business unit. Customers and suppliers are, in a sense, part of your virtual corporation."

A short while ago, most of Horwitz's customers provided data to their clients via hard copy reports. But now she says clients want to go on-line to look at information, to access it quickly, and undertake the analysis process in real time.

Industry experts agree that expanding client/server computing beyond the enterprise can be beneficial to corporations and customers alike, but there is a dark side to moving too hastily and not planning for change. "You keep hearing client/server is a lot cheaper, it's faster. And the reality is it isn't necessarily so," says Sheila Redman, vice-president of worldwide business practices, *Platinum Solutions Inc.* Instead of asking "how does this fit into our overall cycle and infrastructure in handling our business?", corporations have had a tendency to take an isolated viewpoint when upgrading IT applications, says Redman.

So just how benign is the road to client/server computing? That road includes the development of related applications projects, so bottom year cost balloons. According to a report released by the *Sandisk Group*, headquartered in Cape Cod, Mass., the road is littered with over-budget, under-showering projects.

While American corporations and governments spend US\$250 billion on information technology (IT) projects last year, the *Sandisk Group* report estimated US\$140 billion was lost due to project cancellations, delays and cost overruns. A staggering 31.3 percent of projects were cancelled and 53.7 per cent of the projects cost 189 per cent of their original estimates.

The cost of these failures and overruns are just the tip of the

Calorie-Reduced Client-Server Computing

by Paul Lene

If half the hype surrounding network computers (NCs) and their clients proves true, the future of client/server will be calorie reduced, and sales of personal computers to corporations, as well as reseller margins, will be put on a diet.

Low-cost NCs running Java apps, running on fat servers are ideally suited for vertical applications such as transactions processing and point of sale. But they may also put computing power on the desktops of even more people in corporations.

San Microsystems, Oracle, Corel and IBM have all announced NCs. Microsoft, Compaq, Apple and other companies have announced thin clients or lighter PCs. Some companies say they will bring both NCs and light PCs (thin clients) to market.

Microsoft's last-based NetPC will be a simple, low-expensive PC that uses a modified Windows operating system to access applications programs and data stored on servers, much like the NC. The strategy seems to be to drive the price of a PC below the \$1,000 mark, providing stiff competition to backers of the NC concept.

"The PC folks have so much invested that they are going to do a lot to stave off any change that will upset the apple-cart," says a *Forrester Research* analyst. "The idea is to make the NC software not so much even get out."

proverbial saying: lost opportunity costs are not measurable but could easily be in the billions of dollars.

On the success side, only 16.2 per cent of the projects are completed on time and on-budget. In the larger companies, the score is worse: only nine per cent of projects come in on-time and on-budget. And, even when these projects are completed, many are no more than a mere shadow of their original specification requirements.

"We can no longer ignore the three monkeys — hear no failures, see no failures, speak no failures," concludes the Research Group report.

Retailers To The Rescue

That begs two questions: How can retailers best serve their clients to ensure the transition to client/server, or beyond, goes smoothly? How can companies ensure they are getting value from retailers?

While contemplating a move to client/server and beyond, a key issue is change management. Companies have to determine how to incorporate IT into existing change management process. Then problem resolution is monitoring software version control, software migration and testing, all the way up to distribution," says Redner.

If corporations want their connectivity investment to pay dividends, industry experts suggest they should define corporate objectives, determine how information technology will help achieve those objectives, and then shop around for the products and services that will best fulfil the IT requirements needed to meet defined objectives.

"People down the hall will have a closer affinity to people across the continent than what they have with people next to them."

— Skip McGaughey

When investing in new technology, planning for the future is crucial, says Harwitz.

Companies should build flexible, adaptable, computerized, modular systems so they can make present systems more suitable for future expansion while meeting current needs.

Client/Server Will Survive

John Dodge of PC Week describes intranets as "client/server done right." He says intranets are not different from client/server but are simply new client and server types.

Harwitz concurs. She says client/server "as a discipline" is changing for the better. Because of increased flexibility, it now covers clients and servers and servers are clients, especially on the Internet or when using corporate intranets.

Intranets are the natural evolution of client/server, the experts agree. And this evolution is helping companies overcome the limitations of platform-specific and proprietary client/server environments. But beneath the changes, the distributed client/server and object-based architecture will prevail.

As inevitable as the move to a world of transparent global communications may be, the experts warn it won't be a painless move for companies that keep below the plate. The transition for corporations can be eased by defining IT needs, and by working with retailers who have a proven track record in implementing client-server projects, on-time and within budgets. □

Paul Lunn (paul@lunn.com) is a Toronto-based freelance journalist specializing in high-tech and communications issues.

Richard Marshak, president of Toronto-based Marshak & Associates, describes NCCs and their clients as "the concept of the dumb terminal updated for the '90s." Corporations that have traditionally relied on mainframes will ask themselves, "How little computing power can we get away with?" He says it may take a year or so to determine how well their clients will do. "There will be some initial experimentation because the cost savings can look very attractive." However, he warns that savings may evaporate "if it turns out the clients can't do the job."

If the savings are there and the market accepts them, will that set prices for lighter computers mean less margin for resellers?

It's not an issue for Phil DeLano, president of Richmond Hill, Ont.-based Oxyg Computer Inc. "If a reseller business model is based on selling clients, they're in the wrong business or should rework their business plan," he says. "Almost 90 per cent of our business is in the server side."

Paul Basso, product manager, commercial desktops, Compag Canada, feels it's too early to know what this client margin will be for resellers. Even if squeezed on the hardware side, healthy margins will come from a combination of hardware and system integration," he says.


System integration is where dealers can provide value, add for vertical markets such as retail, healthcare and banking — markets that will be looking for the cost savings and network solutions that this client offers.


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The Recordable CD Yields Opportunity

by Geoff Wheelwright

Recordable CD systems have been with us for a couple of years now — and have changed dramatically during that period (and will for the better). This has created unprecedented opportunities for resellers and dealers to create new solutions using CD-R technology.

CD recorders are now cheaper than ever, easier to use and a better option for a wider variety of potential customer solutions than many conventional backup devices. With CD-R media typically selling for between \$12 and \$15 per blank CD — each with the ability to store up to 650MB — the cost per megabyte of this medium is very attractive when compared to more conventional tape backup drives.

Perhaps even more important is that CDs are now a universal media, like floppy disks. Any user who has purchased a half-decent PC over the past three years is likely to have a CD-ROM drive in that machine — and is therefore capable of reading whatever a CD recorder records onto a CD.

This makes it a much better medium for passing large amounts of data between users, because the person who makes the CD can be confident that there will be large numbers of people who will be able to read that CD on their PC.

All of these means make CD-R systems a perfect vehicle for resellers and dealers to use in creating new and innovative solutions for their customers.

Here are just a few examples of how CD-R technology is, or might be, used.

Backing Up The Company

When most small- to medium-sized companies have wanted to back up the data on their PCs — whether stand-alone or on a network — they have typically relied on tape drives as a way of doing it. Tape drives have commonly been cheaper than their optical counterparts and been the "workhorses" of the data backup world. They have, however, failed to meet the standard of universality against which lower-cost media (such as floppy disks) have been judged.

In cases where you didn't want others in the company to be able to get easy access to backed-up data, perhaps that was not a problem. But in many small- to medium-sized businesses, this kind of universality can have big advantages. It means, first and foremost, that backed-up data can be restored from virtually any PC with a CD-ROM. It means that your customers do not have to worry about

getting one of those backed-up data, even if their CD-R system should be damaged.

Provided the CD back-up copies of the data are stored in a safe place, data can be restored without the cost of replacing or repairing the CD-R right away.

The latest trend in CD-R systems is to offer a parallel port option — such as HP's 600Mbps — to allow back-ups to be made on virtually any system, including notebook computers. The fact that the CD recorder attaches to the parallel port also eliminates the need for users to have to get inside the PC, add SCSI adapter cards (with their sometimes exorbitant configuration problems) or set a whole load of jumper switches.

The whole thing can be done in a few minutes and the user is up and running. This kind of back-up is also the perfect solution in the instance that the user has a few PCs in their company, but is not running a network — the parallel port CD recorder can simply be moved from machine to machine doing back up work.

The Enthusiast

The second big market for CD recorders these days is the home market. Not only can such people more easily back up their data with CD-R drives, but they can also make their own music CDs. The CDs can also contain music they have created themselves or selected tracks copied from existing commercial CDs to create their "compilation CD" that can be played on any standard music CD player.

For The Sales Force

Insurance agents, financial planners and other sales executives can use potentially huge customers for CD recorders. If a company has the ability to easily create CDs for its salespeople to use in customer presentations — either on their own notebook computers or on customer computers — then they can have a big advantage.

The advantage is quite simple — the data or application created for the sales force does not have to be installed by the company's IT department. It merely needs to sit on the CD and can be called on when needed. It might simply contain a set of large PowerPoint presentations, a couple of MPEG-2 video files that show the latest corporate promotional videos, some large quotation tables for loan calculations, actuarial tables for insurance or anything else that can make effective use of 650MB.



Interpreting

real estate agencies could even take their most recent database of homes for sale (perhaps including detailed digital photography) and make that available on a CD which sales forces could carry with them.

Some of these functions could be replaced by simply allowing the mobile sales force to have access by modem to an Internet "intranet" where this data is stored. But standard modem speeds are not yet good enough to make that an effective answer for quickly getting to large sales files or huge presentations.

Some customers may also have a need to create their own small-scale promotional CDs. This might arise in situations where it would be useful for them to create such items for a few major clients, but they would not require any mass duplication. CDs produced on an in-house CD recorder would prove the perfect answer. In such circumstances, CDs could also be created on an "as-needed" basis, without the requirement to pay large duplication fees up-front for creating CDs that you might not ever use.

A Good Solution

CD recorders offer the chance for dealers, resellers — and their customers — to create a wide range of effective and creative solutions that meet the many data storage and flexibility challenges they face. The medium is universal, costs have come way down (meaning that you can now buy minimal CD recorders from major manufacturers now for well below \$1,000) and speeds have improved (with 4X being the typical standard for mid-range CD-R systems).

Inevitably there will be further evolution in the market, particularly as DVD (Digital Video Disc) technology starts to make an impact. Expect to see the first major wave of DVD recorders in 1998, with even higher capacities, a greater set of file format capabilities and a whole new set of applications. But that, as they say, is a different story ☐

Geoff Wheelwright is a Vancouver-based technology and business journalist. He can be reached at geoffwheelwright@vnet.com.

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Hard Drives

Bigger, Faster and in DEMAND!

by Jeff Bruns, Tim Boughly, Will Green, and Mark Wilson

You will have no doubt noticed a corresponding need has arisen for extremely reliable, high-performance, high-quality storage solutions by desktop PCs, workstations, servers, disk arrays, mini-computers and notebook systems.

Information that was traditionally stored in analog forms is now being stored digitally on hard drives. This transition has also increased the demand for even larger and faster data storage devices.

Computing today brings increasing levels of performance and functionality to users. Are your customers purchasing Office 97? Have them check their hard drive space!

Competed to do so, hard drive manufacturers have answered the need for high volume storage of information with increasingly larger fast hard drives. Five years ago, a 40 MB disk drive was a big deal! Today's drives are classified by comparison. Storage-hungry applications and operating systems demand higher and higher capacity and disk drive manufacturers are shipping millions of drives from 2GB to 9GB and beyond.

Digitizing Trends

Data is critical — it is at its heart. Tables, images, text, encyclopedias, audio/video are being digitized, archived and stored. Within the past decade, there has been an explosion in the number and types of digital information sources: business transactions, medical information, art, music and film are examples. They're all being digitized and stored.

The vision for the future includes information in the form of "notes" that never close, doctors that are always on duty, libraries not universities at one's fingertips, global classrooms, and continuous on-demand

information in the information technology industry. Corporate and consumer expectations of all kinds now require continuous connectivity through on-line, on-demand, and on-time access. They look to computing to shrink distance, collapse time and lower cost. The disk for companies to get word and provide information on-line requires information in digital form. Many companies are striving for a more paper office by publishing information on internal Web sites.

Multimedia applications, the downloading of images, and on-line references are just a few examples of the way in which corporate and consumer markets are testing.

High Capacity Storage Never More Affordable

Corporate entry-level systems and small home/offices have high expectations. These buyers need greater functionality, high capacity storage, graphics and Internet access at the lowest possible price. Whether its 500MB or 9GB, an important issue still remains, keeping the costs down. The average cost of purchasing a 1GB hard drive five years ago was about \$1,500 compared to today's street price of \$300. Internet and network computing have become budget-crushing technologies. The market for storage products is exploding.

The Tests

We used several well-known benchmark programs to measure the performance of hard drives. Each of them, as can be expected, gave different results for the various tests. Measurements were made on various methods of data transfer, such as sequential and random. Each program provides a report on some form of access time measurement, although they don't always match the numbers specified by the manufacturer. All-in-all, they each tell a tale of just how quickly a particular drive can perform a given function.

Just to make things interesting, we decided to do a little test of our own — something quite simple, but also very useful because it

goes beyond the benchmarks and provides a consistent, everyday scenario. The test actually consisted of two parts. First, we generated a file 2GB in size using a software program that randomly wrote on the drive to another and copied the process from start to finish.

This is a real-world test of a sequential read because the file we were copying was contiguous. Our second test consisted of copying two directories from one part of the drive to another. These two directories were filled with 400 files and 60 other sub-directories, totaling 50 MB. We chose this as the test size to demonstrate how copying NMB using two very different scenarios can turn out so differently. This test is an example of a random read/write task.

To our surprise, the Master 2420 managed to copy that entire directory tree in just 12.35 seconds, whereas the average among the other drives was closer to 60 seconds. A full disintegration of each drive was performed prior to these tests to give each drive the exact same testing conditions and no third-party caching programs were used. We used partitions sizes of 1GB throughout the entire testing process. All of the tests, with the exception of SysInfo from the Norton Utilities v2.0 for Windows 95, were performed under DOS 6.22. All tests were conducted on a Pentium 166MHz machine with 512KB of Level 2 cache and 64MB of RAM. Each hard drive was configured for Master mode on the primary channel. Each test was executed three times, with the final average being shown on the comparison chart.

In Conclusion

This month, we've had the privilege of putting the very latest drives to the test. Indeed, much has happened in the world of hard drives during the past five years. These new drives boast superior specifications, and are constructed with extreme precision.

The new breed of mass storage drives has entered the consumer market very dramatically, with competitive pricing to make significant storage all the more accessible to just about everyone.

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Fujitsu MP430SAT and MP430AT**Suggested Retail Price:** 3.5GB — \$489, 5.2GB — \$659**Street Price (approximate):** \$439 and \$575 respectively**Retailer Price (approximate):** \$399 and \$529 respectively**Marketing Support For Resellers:**

Toll-free tie-in to resellers

National advertising

Maintenance And Technical Relationship With Resellers:

Three-year warranty on these drives

Warranty includes parts and labor

Toll-free technical support for resellers

Dedicated technical RSS

Web site includes technical information

Volume Discounts: None**Same Day Availability:** None**Market Development:**

"The Fujitsu hard drives are targeted towards PC builders/integrators, looking for cost-competitive pricing, high quality, and high

reliability," says Irving Finkelman of Fujitsu.

Product Strengths:

"Our strengths are in leading-edge design, incorporating advanced magneto-resistive (MR) read/write head and partial response/magnetic (PRML) technologies. The end result is improved signal-to-noise ratios, less chance of data loss than with standard heads, and overall higher data reliability," said Finkelman.

Editors' Notes:

Two of Fujitsu's latest creations are these new drives, with capacities of 3.5GB (MP430SAT) and 5.2GB (MP430AT). Both drives use the latest in technological advancements, offer great performance and are competitively priced. Both drives feature low access times of 10 ms, high spindle rates of 5,400 RPM (buffer sizes of 128KB) and the new ATA-3 interface. As far as raw performance goes, the larger MP430AT managed to achieve some very impressive results, making it a candidate for an Editors' Choice award. Both drives have an MTBF rating of 500,000 hours and come with three-year warranties.

Western Digital AC4000L**Street Price:** \$453**Technical Support:** Three-year warrantyWeb site at <http://www.wd.com>**Editors' Notes:**

Western Digital's AC4000L leaves little to be desired when it comes to both value and performance. The drive has a capacity of

4GB, a spin rate of 5,200 RPM and an access time of 11 ms. It also has a larger-than-average 256KB buffer to help squeeze out every last drop of performance.

The drive comes with excellent documentation in the form of an easy-to-understand manual, as well as a full-size poster with diagrams on how to install the drive.

Seagate ST33240A and ST36450A**Suggested Retail Price:** ST36450A — \$589**Street Price:** ST33240A — \$427**Marketing Support For Resellers:**

"Seagate's Web page offers many ways for resellers to obtain the information they need. We recommend the "Sales Partners" button for a listing of authorized distributors and sales offices," says Judy Plummer of Seagate.

How Does Seagate Address This Product in The Market?

"The Modulus Pro 6450 is designed for either new high-end desktop PCs or upgrades. It is perfect for the SOHO market. The Modulus 3240 is designed for both value-class desktop PCs and upgrades. It too is suitable for the SOHO market," said Plummer.

What Are The Products' Strengths?

"The Modulus Pro 6450 offers performance, reliability. The Modulus 3240 is certified for home/office environments. Both drives are multimedia-ready and are shipped with DiscWizard installation/management software."

Editors' Notes:

Seagate gives us two of their latest creations, the ST33240A and the ST36450A, with capacities of 3.2GB and 6.4GB, respectively. The 3240A is a 3.2GB drive, making it ideal for

anyone looking for a drive with a capacity such as this and with a name they know well and can trust. This drive has an access time rated at 12 ms, a buffer of 128KB and a spin rate of 4,500 RPM. Performance on this drive was around average in comparison to the other unit's tested.



The ST36450A is, in many ways, the ideal drive. It boasts a storage capacity of 6.4GB and leaves nothing to be desired when it comes to raw performance. The drive, although large in capacity, uses a convenient 3.5-inch form factor. It has a spindle rate of 5,400 RPM, an access time of 10 ms and the largest buffer of all the drives tested, a total of 512KB. With all this, plus the new ATA-3 interface for the fastest possible transfer rates and an MTBF rating of 500,000 hours, you have yourself a true performer.

IBM DAUA-33240**Suggested Retail Price:** \$531**Reseller Authorization**

No authorization is necessary for reselling Options by IBM products.

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Resellers listed on the IBM Web site
POP displays
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Maintenance And Technical Relationship With Resellers

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Limited warranty includes parts and labor
The product adopts the on-site warranty of the IBM system it is installed in
Resellers can offer service
Toll-free technical support for resellers
Dedicated technical R&E
Dealer-specific space on the Web site
Web site includes technical information and drivers

Volume Discounts: Yes**Does Unit Availability And Resellers?**

IBM has a longer program

What Is IBM's View Of The Market?

"IBM has been manufacturing storage devices for over 30 years, so we know a lot about storage. This knowledge has allowed IBM to develop a highly scalable family of hard drives for client systems and servers alike. The Deskstar family of hard disk drives offers excellent price-performance for IBM and IBM compatible ISA PCs," said IBM sources.

What Are IBM's Products' Strengths?

"Reliability — Magnetoresistive head technology allows IBM to build drives with increased areal density, therefore fewer parts, resulting in higher MTBF rates. Performance — We offer a high sustained data rate. High capacity — IBM hard drives deliver up to 15 percent more disk space for data storage by packing the Data IDs in silicon rather than moving them on the hard drive," says IBM.

Editor's Notes:

IBM's new DAUA-33240 is a 3.2GB-capacity drive that would make a great addition to any system. The drive is capable of sustaining high transfer rates and had an impressively short average seek time of only 9.3 ms — the fastest in this survey. The 33240 uses the standard ATA-2 interface, has a spindle rate of 5,400 RPM and a three-year warranty.

Quantum Fireball TM 34GB and Quantum Bigfoot CY 64GB**Suggested Retail Price:** CY64GBA — \$399**Street Price:** TM34GBA — \$476**Editor's Notes:**

Quantum has two new drives available, each suited for different environments. The models we tested first month were the Fireball TM34GBA and the Bigfoot CY64GBA. The Fireball 34GBA is a 3.5GB drive, making it attractive to anyone who's looking for something just a little larger than 3-IGB. It features a spindle rate of 4,500 RPM and a 14.5 ms average seek time. The Bigfoot 64GBA, on the other hand, has a generous formatted capacity of 6.3GB, a spindle rate of 5,600 RPM and an access time rated at under 14 ms. This drive is ideal for anyone looking into buying something with

enough storage space for both today and tomorrow. Both drives managed to achieve reasonable test results, based on their design specifications. It's also worth noting that the 64GBA is

designed using a 5.25-inch form factor, whereas the 34GBA uses the standard 3.5-inch type. Standard warranty on these drives is three years.

**Maxtor 3350BA and 3312BA****List Price:** 3443 and 3450 — respectively**Marketing Support**

Marketing support for resellers includes the Maxtor VAR Partner Program. This is open to VARs selected by distributors.

Technical Relationship With Resellers

Three-year warranty includes parts and labor
Toll-free technical support
Web site includes technical information
A No Quibble Service policy

Does Unit Availability

The company periodically offers device programs on select drives.

What Is Maxtor's View Of The Market?

The company says of its 3.5GB and 3-IGB products: "Now, the most reliable EIDE drives are available with high performance and high capacity prices."

What Are The Products' Strengths?

Maxtor cites the strengths of "high reliability, high performance, a variety of capacity prices and the No Quibble service policy."

Editor's Notes:

Maxtor has developed a reputation over the past few years as being able to manufacture drives that deliver both performance and great value.

The two models we received for this month's evaluation were the 3350BA and the 3312BA, with capacities of 3-IGB and 3-IGB, respectively. The 3-IGB drive offers good overall performance and is well-priced for a drive of its size. The larger 3-IGB model managed to surprise us on a number of occasions, achieving some of the best results in the survey. Among the drives more appealing qualities are its larger 324KB onboard cache and the use of the ATA-2 interface.

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PCPOS-JR

52-key prog. with 58 normal PC-keyboard alpha keys, num. lock, scroll and caps lock LED, AT keyboard wedge, download software, AT keyboard cable. Optional modules include: MSR, LCD (4x20, 2x24), RS232 interface, barcode decoder interface, single, double, quads and blanks available.



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Triple track and Smart Reader optional.



MC128-MSR

128-key prog. AT keyboard wedge, download software, AT keyboard cable, MSR tracks 1 and 2.
Triple track and Smart Reader optional.



MSR128MX

128-key prog. flat membrane with feed back, AT keyboard wedge, splash resistant, download software, AT keyboard cable.
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Core Test

Buffered Read (KB/sec)
Sequential Read (KB/sec)
Random Read (KB/sec)
Average Seek Time (ms)
Track-to-Track Seek (ms)

Fujitsu
MPA3302AT

14149
8893.3
3306
12
3.7

Fujitsu
MPA3302AT

14149
8872.0
3340.3
11
3.3

IBM
DAGA-33240

13643.7
8684.0
3329.3
9.0
2.8

Maxtor
ESP00A

14169.3
8328.0
1792.7
12.9
5.5

BENCH

Data Transfer Rate (KB/sec)
Data Access Time (ms)

9388.7
16

8888.8
19

4348.7
3.8

4088.0
7.9

Norton Speeds 4.0 for DOS

Data Transfer Rate (KB/sec)
Average Seek Time (ms)
Track-to-Track Seek (ms)

3311.1
6.32
1.85

3367.5
5.38
0.94

3229.3
3.71
1.6

2811.9
12.4
4.58

Synthetic 3.0 for Win95

Cached Reads (MB/sec)
Cached Writes (MB/sec)
Physical Benchmark (MB/sec)

34.2
26.7
1.2

33.9
26.6
1.1

34.1
31.7
6.3

33.7
30.6
3.7

File Copy Tests

Large Dir Transfer Time (sec)
Large File Copy Time (sec)

28.1
31.88

31.03
31.02

35.76
33.0

58.5
48.5

Drive Specifications

Formatted Capacity (GB)
Form Factor
Interface Type
Buffer Size (KB)
Average Seek (ms)
Spin Rate (RPM)
MTBF (hours)
Acoustic noise (dBA)
Warranty
Price
Toll-free contact
Local contact
Internet contact

3.5
3.5-inch
ATA-2
128
18
5400
500,000
36
3 years
\$650 list
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3.5
3.5-inch
ATA-2
128
18
5400
500,000
36
3 years
\$650 list
1-800-383-0716
(925) 603-6464
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3.5
3.5-inch
ATA-2
128
18
5400
5400
37
3 years
\$521 list
1-800-443-7889
(303) 316-5000
www.pc.ibm.com

3.5
3.5-inch
ATA-2
128
12
4,980
400,000
37
3 yrs 3 yrs
\$440
1-800-252-2887
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For benchmark figures where numbers are measured in ms, the lower numbers represent better ability. Figures where numbers are measured in KB or MB/sec, the higher numbers represent better scores. All prices shown are average street prices in Canadian dollars, unless otherwise indicated.



Motorola RS1200	Quantum TM30400	Quantum CY6400	Seagate STC2400	May '97	May '97
				Seagate STC2400	Western Digital ACM4000
14412.0	13412.0	13412.0	13862.7	14100.0	14000
8700.0	8660.0	7677.3	8700	8600	9000
3604.3	3213.0	2330	1600.0	3000.7	2341.1
76.0	6.1	10.9	10.6	6.60	10.0
3.6	3.5	3.5	3.0	3.3	3.0
9600.0	3436.7	3633.0	3046.7	3736.7	3370
3.6	6.1	6.3	7.4	6	6.6
3700.0	3000.0	3610.0	3640.0	4012.0	3000.0
8.60	8.57	10.40	10.0	6.60	10.00
2.27	3.4	3.70	3.2	3.47	3.4
24.1	24.0	24.9	33.7	33.0	30.0
20.0	27.1	27.0	28.6	29.7	30.0
9.2	4.0	4.4	3.0	6.6	9.2
33.35	26.77	186.0	37.40	60.20	32.7
31.6	36.2	48.0	39.6	30.1	34.0
5.1	3.0	6.6	3.2	6.4	4
3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch
ATA-2	ATA-2	ATA-2	ATA-2	ATA-2	ATA-2
200	120	120	120	60	200
10	10.6	<14	12	11	11
5,000	4,000	1,600	4,000	5,000	5,000
500,000	400,000	300,000	500,000	500,000	350,000
30		34	34	30	
3 years	3 years	3 years	3 years	3 years	3 years
5470	5470	155390 lba	5437	155390 lba	5480
1-800-262-8897	1-800-634-6546	1-800-624-5546	1-800-430-6560	1-800-430-6560	1-714-832-6000
(408) 432-1700	(408) 694-6800	(408) 694-6000			
www.mstar.com	www.quantum.com	www.quantum.com	www.seagate.com	www.seagate.com	www.wdc.com

Performance

Seagate ST34000A
Fujitsu MP3400240

Our performance award goes to the fastest overall drive in the survey. Usually this award is given to one product, but this month we must hand out two because of what the numbers tell us. Our two fastest performing drives were the Seagate ST34000A and the Fujitsu MP3400240. Both of these drives scored extremely well in many of the tested categories.

The Fujitsu MP3400240 is a high performance drive with a capacity of 5.0GB. It managed to score extremely well on our benchmarks, taking top spot in a number of categories. The drive uses the new ATA-3 interface, has a spindle rate of 5,400 RPM, and an average access time of 10 ms. The list price on this new model from Fujitsu is \$680. Overall it's an excellent drive, and should definitely be considered if you're looking for a unit with plenty of storage and excellent performance.

The Seagate Model Pro ST34000A is one of Seagate's latest creations. This 4.4GB drive managed to surprise us in a number of ways. First of all, all of that capacity is squeezed into a 3.5-inch form factor. Second, it achieved some of the best results on our benchmarks in various categories. It has very high transfer rates and low access times, making it the definite choice for someone looking for pure raw performance. The drive uses the ATA-3 interface,

has a large 512KB buffer, a spindle rate of 5,400 RPM and an average access time of 11 ms. List price was \$590. Street prices on both the Seagate and Fujitsu drives weren't available at press time. With a access time level of only 30 ms, the Seagate drive was the fastest drive in this survey. Seagate has many previous years of experience when it comes to manufacturing hard drives, and the Model Pro is a testament to that.

Overall

Western Digital AC34000L

If you want a drive that has a bit of everything, get the Western Digital Cirrus AC34000L. This new 4GB drive is one that we would undoubtedly recommend for someone looking for both performance and value. The drive's unique size of 4GB is another plus. If you feel this 4 GB is not quite enough, and that a 5GB drive or larger is overkill, Western Digital designed this drive with you in mind.

Once again, this drive obtained some of the best scores on our benchmark suite. Using a large 256KB onboard buffer, a low access time of 11 ms and a spindle rate of 5,200 RPM, this drive will have no trouble shuffling your data from sector to sector. It has an average street price of \$449, giving it a mere 12.3 cents per megabyte stage cost. An excellent drive you won't want to overlook. **B**

Steve Melnick, The Kingston White and Red Blinds are Canadian Computer Wholesaler's Lab Test Editors. They can be reached at (416) 325-8004.

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from Newsbytes

Police detain youths over Tamagotchis theft

The craze over Bandai's Tamagotchi electronic pet has dominated the game since the same category as Nike "AirMax" sports shoes among Japanese youth.

Police reported the recent detaining of four high school boys for the theft of a Tamagotchi from a fellow student. The pet, a small key-chain type, revolves the raising of an electronic chicken from chick to old age. The chick reaches old age if given a good life and fed regularly. Owners must also play with and clean up after the chick if they want to prevent it dying.

Impossible to buy in shops, street peddlers of Tamagotchis have racked up to 20 or 30 times the retail price of just under 2,000 yen (\$185 to \$60).

Fujitsu intros systems for mobile PC users at Comdex/Japan

Fujitsu Ltd. used the recent Comdex/Japan exhibition to show two new computers for mobile users. The "Ueber" is a new notebook-style computer that features a fully removable display and a new PDA from the company integrates a cellular telephone into the case for wireless use.

The Debut 700 runs on a dropped-in slip easily into a case or bag, said a Fujitsu representative at the show. It features a 486-equivalent processor, internal 28.8Kbps

modem, 7.3-inch liquid crystal display and a slot for PCMCIA Type II cards. The second new product on display, which is a year old, was a new personal digital assistant (PDA) that has a space for a cellular telephone on the case. The phone lies in a docking slot and is unlocked when the unit is the user has, in effect, a PDA with built-in cellular telephone. This means all sorts of mobile data applications can be run from the unit without the need for a separate phone and connecting cable.

Apple shuts down Singapore design centre

The financial crisis at Apple Computer Inc. spilled over to Singapore recently with the company deciding to pull the shutters down on its design center and lay off 101 of its 504 employees in the island state.

Set up in 1993, the Apple Design Center-Singapore was involved in research and development work on technologies such as speech recognition and ported output devices for Asian languages. It also carried out work relating to printed circuit board layout, analog and digital circuits and design validation.

With the closure of ADCS, its director, Dr Lewis Woo, is off the payroll as well. "The closure is the direct result of Apple's consolidation of R&D hardware design at the company's headquarters in Cupertino," Woo said in a matter-of-fact way. He said no decisions had been made on

further development of software for the Asian market formerly conducted by the center.

Toke Chiong, meanwhile, said the layoffs affected three groups of employees, namely the manufacturing, R&D and support divisions. Apple, however, has decided to retain its display design team, which will continue to be involved in the monitor manufacturing operations. The team will play an enhanced role in the company's partnership with ST Electronics Systems Assembly, which last year was granted the right to build high-end Apple-designed monitors.

Peter Tan, managing director of Apple Computer, Singapore, said: "The restructuring team is in line with the recent moves by the headquarters to implement a more streamlined organization to return the company to sustainable profitability."

Dell Computers targets Thailand market

Dell Computers CEO Michael Dell visited Bangkok last week to shake up the competition in Thailand, Dell's newest market on the Asia Pacific region.

According to Peter Sykes, Thailand manager, the company has had a good start with sales to a number of multinational companies. Dell sells direct in 11 countries in the region: Hong Kong, Mexico, Japan, Singapore, Malaysia, Taiwan, Thailand, Korea, Brazil, Australia and New Zealand. All orders from the region are processed in its manufacturing facility in Perung, Malaysia.

According to Datapoint, Dell held 10th place for market share in the Asia-Pacific region in Q4 '96. Revenues in this region, including Japan, grew 60 per cent in that quarter, as compared to the same quarter in 1995. Sales in 1996 sales reached US\$476 million.

Dell recently announced they would start manufacturing workstations, and should be available in Asia this summer, said Don Klemm, Asia-Pacific director of corporate communications. ■

Choose Your Advisors With Care

There are indisputable benefits to consulting the 'experts' in certain situations. However, whom you turn to for help can be critically important. *Exert caution, when choosing your source of professional advice.*

by Douglas Gray



As a result, you have a lot of hats to wear, but you can only wear so many hats well.

You need to rely on objective and expert professional advice to compensate for areas that are outside your comfort zone or knowledge. But how do you find the best advisors in the first place? And if you already have advisors, how do you check to make sure that they are the right ones for your needs? A lot of business owners simply stay with the same people out of habit. This can be hazardous to your business health.

Because of the costs associated with hiring a lawyer, accountant, or financial planner, some people are inclined to try the do-it-yourself approach. This can be a short-sighted decision and detrimental to your interests. For instance, lack of professional tax and estate planning could result in a lot more tax being paid during your lifetime and on your death, than was otherwise necessary. One person who signs a lease or contract without having it reviewed beforehand by a lawyer may regret it for years to come.

The right mix of professional advisors will inspire confidence, enhance your peace of mind, reduce taxable income and protect your legal and financial health. The wrong selection will be costly in terms of time, money, and stress. There is enough stress operating a business. You don't need the extra aggravation.

Here are some benchmarks for evaluating your existing or potential future advisors.

Qualifications

Before you entrust an advisor with your affairs, you will want to know that he or she has the appropriate qualifications to do the job. This may include a lawyer's or accountant's professional degree, or if a financial planner, professional training accreditation and experience relative to their professional area of expertise. Lawyers have to be accredited to practice law, but anyone can call themselves an accountant or financial planner.

When selecting a professional accountant, look for a Chartered Accountant (CA) or Certified General Accountant (CGA) designation. A financial planner should have Certified Financial Planner (CFP) or registered Financial Planner (RFP) designation or both.

Experience

It is very important to take a look at the advisor's experience in the area in which you need assistance. Such factors as the degree of expertise, the number of years' experience as an advisor, and percentage of time spent practicing in that area are critically important.

Compatible Personality

If you are going to have an on-going relationship with the advisor, it is important that you feel comfortable with that relationship in terms of the degree of communication, the attitude, the approach, the candour, and commitment to meet your needs. A healthy respect and support will increase your comfort level when discussing your needs, and thereby enhance further understanding of the issues. If you don't feel that there is the degree of good chemistry that you want, don't continue the relationship. If you don't relate well to someone, it is only human nature to resist contacting them. This could compromise your best interests.

Objectivity

This is an essential quality for a professional advisor. If advice is tainted in any way by bias or personal financial benefit, obviously it would be unreliable and self-serving. That is why you want to get a minimum of three opinions on your personal situation in terms of advice, before carefully deciding which professional to select.

Lawyers and professional accountants (CAs, CGAs) cannot obtain any direct or indirect collateral benefit from advising you, so it would be a conflict of interest. They also have professional liability insurance coverage in the event they give you bad advice. However, when dealing with a financial planner, it is a different situation. Some offer fee-only services and receive no other benefit from their advice, and confirm this in writing. Others obtain a fee as well as commissions from the products they recommend or sell to you. This could potentially influence the nature of their advice.

Ask a financial planner if they have professional liability insurance coverage and if not, why not. If they are covered, find out that fact and the amount confirmed in writing.

Trust

Trust is a vital trait in the person you select to advise you. Whether the person is a lawyer

accountant or financial planner, if you don't intuitively trust the advice as being solely in your best interests, never use that advisor again. You cannot risk the chance that advice is generated primarily by the financial self-interest of the advisor, with your interests as a secondary consideration.

Comparison

It is a good rule of thumb to ask a manager of three business advisors before deciding which advisor is right for you. You need that qualitative comparison to know which one, if any, of the three, you want to rely on. Seeing how they each respond to your questions will be a good reference point. The more coaxing you are in your selection criteria, the more likely it will be that a good match is made, and the more beneficial that advisor will be for you. Write down your questions before your meeting so you don't forget, and prioritize them in case you run out of time. The final meeting with any advisor is usually free. Ask in advance.

When going through the process of selecting an advisor, you can get prospective names from friends who have a trusted advisor. Turn the Yellow Pages and turn professional associations in your province. For example, contact the Lawyer Referral Service operated by the Law Society or Bar Association, Institute of Chartered Accountants, Certified General Accountants Association and Canadian Association of Financial Planners (CAFP). Contact CAFP at their national toll-free number of 1-800-345-2233. You will be sent a copy of the members in your province with their backgrounds, and whether they offer services in the fee-only, fee-plus-commission or commission-only format. You will also receive a booklet on selection criteria. ☐

Douglas Gray, LL.B., has had extensive experience as a lawyer (practising as well as in-house). He is also a speaker and author of 13 best-selling business books, as well as an investment software program. His books include The Complete Canadian Small Business Guide and Making Money (both published by McGraw-Hill Ryerson), and Start and Run a Profitable Consulting Business and Marketing Your Products (both published by Self-Counsel Press).

Tech Stocks Are Down

But the future is still bright for the technology sector.

by Thomas Allen



The downturn that started with technology stocks at the end of January has earned through to the rest of the market with the Dow Jones and Toronto stock exchanges down between eight to 10 per cent. The technology sector followed the markets lower with many companies down 10 to 40 per cent, or more.

It is important for investors and traders to remain calm. When the technology sector takes a new job — do not get overly optimistic, and when it falls sharply — do not get down and gloom. The fact is that capital markets fluctuate for short-term reasons and it is far more important to look at the longer-term trends.

In the short term, the stock market is worried about rising U.S. interest rates, a stronger economy with signs of inflation due to increased wage pressure. It is important to note that with the strength in the U.S. economy, small and corporate sales are looking very strong. This may be negative for the market but it is great news for retailers. In fact CompUSA Inc. stated this sales for the third quarter ending in March rose 19 per cent to US\$1.27 billion from US\$1.07 a year earlier. It was interesting that corporate sales surpassed consumer sales. This was an encouraging sign and many retailers were coming off a disappointing previous quarter. This U.S. trend should spill over to the Canadian market in the months ahead.

Another development in the market that affects some retailers is the weakness of the Canadian dollar. The Canadian dollar has fallen to below 72 cents and appears to be headed lower. For exports this is very positive because it makes our products cheaper. However if you are importing foreign components or products this will increase your costs. Retailers that have significant exposure to the Canadian dollar should look at implementing

a hedging strategy. In working with a financial advisor any company or individual can protect themselves from currency fluctuations.

Networking

There's been lots of news in the networking industry about mergers and consolidations. A merger between 3Com and U.S. Robotics spawned a complete rework of the sector by Wall Street analysts. Uncertainty in the sector took its toll on Cisco Systems and the stock has fallen below US\$50 after peaking above US\$75. Analysts are worried that competitors will chip away at Cisco's leading market share. To add to this, a report surfaced that most ISPs will be delaying major equipment upgrades in order to improve their bottom line in the short term which caused the entire networking sector to sell off. It appears that investors are overreacting to any slowdown in the need for networking equipment. The sell-off has been over done and it appears to be a great opportunity for more aggressive investors to enter the market. For the first of next year until you see pronounced positive momentum in the long run sell, with caution, and you will be rewarded.

For retailers, I think that the picture is much brighter than the stock market is portraying at the moment. Strong economic growth may not be good for the market because it causes inflation fears, however, it is very positive for the technology industry because it increases demand.

Hardware

A dramatic shift in the IBM no longer sets the tone for the entire technology sector. IBM is still an important player in the market, but a downgrade in IBM does not move the sector like it did in the past. IBM was downgraded from a Buy to a Hold by a number of analysts last month and under ordinary circumstances most technology stocks would sell off in sympathy, this has not happened of late.

The market now looks at companies like Intel and Microsoft for a better indication of

the sector. Is this a sign that the technology sector will start trading with more understanding and less volatility? Don't count on it, but it is a small step in the right direction.

The big names on the street is that Larry Ellison of Oracle might be looking at taking over Apple. Apple's shares have rallied 11 per cent based on this speculation. Stay tuned for further developments.

Chips

Intel stock price has weakened from a high of US\$165 to the mid-US\$130s amid concerns of increased competition from Advanced Micro and market jitter. I think that these fears have been exaggerated and that this price weakness is another buying opportunity. Sales of computers with MMX microprocessors are stronger than expected.

Motorsola's stock has been slumping lately but never count a quality player out. Just as some analysts were about to ring the bells, Motorola turns around and announces a US\$1 billion offshore contract in Japan. The stock rallied, to close back up over \$60. The lesson to be learnt for investors and traders is that brand name companies may have a year or quarter where they fall behind or underperform but they always seem to rise to the top.

Software

Microsoft was not hurt to the same degree as most of the other technology stocks even with the announced delay for the launch of Windows 97. Microsoft is a powerhouse but there might be signs of a few areas of weakness. Java technology is gaining momentum and there seems to be concerns about ActiveX. Netscape is not building under pressure from Internet Explorer and the possible strengthening of Apple if it is taken over will all contribute to making Microsoft's upward momentum. I would watch Microsoft closely and wait for lower prices before investing.

Oracle has weathered the correction with relative strength. Watch for a bounce in the share price as analysts begin come out with recent Buy ratings on the stock. Although Ellison has shown interest in Apple he has stated that he will not directly involve Oracle into the venture. ☐

Thomas Allen is an investment executive with ScotiaFidelity and can be reached at tap@scotiabank.com.

Company Name

Year Low US\$

Year High US\$

March Average US\$

INTC	INTEL CORP	26 75	125 50	138 00
ORCL	ORACLE INC	44 10	68 75	61 00
IBM	INTL BUSINESS MACH	68 15	178 10	133 25
AAPL	APPLE COMPUTER LTD	15 12	28 50	19 50
MSFT	MICROSOFT CORP	43 75	73 75	54 50
IBM	INTERNATIONAL BUSINESS C	25 25	37 12	36 75
MSFT	MICROSOFT CP	48 50	103 50	87 00

Upgrading and Repairing PCs

Author: Scott Mueller

Title: 191.13

Latest Edition (Hard Cover)

ISBN 0-7717-7-102-3-0

by Stephen Mueller

Are your customers concerned about the high cost of new computer purchases and want to upgrade existing computer systems? Do you sell to "do-it-yourself" customers? Well, look no further. *Upgrading and Repairing PCs* is the complete hardware reference and upgrade guide for resellers, educationalists, and knowledgeable end-users.

This 1,430-page book includes seven comprehensive sections. Numerous diagrams, charts, and tables illustrate major points and detail hard-to-find information. This is for people who want to upgrade, repair, maintain, and understand the technical intricacies of PC-compatible computer systems. The book covers the components found in the latest eight-bit machines to the latest high-end 64-bit workstations. An enclosed CD-ROM disk contains Windows 97 and Windows 97 PC benchmark software from ZiB-Davis. Be forewarned! For full installation, your customers will need more than 228MB of free disk space.

Included within the introduction are chapters covering PC history, overview of features and components. The tutorial on system installation and operation is excellent.

The chapter "Primary System Components," follows with an extensive description of motherboards. The chapter on bus structures and IO cards illustrates ISA, EISA, MCA, PCI, VESA, and PCMCIA.

"Microprocessor Types and Specifications" is very extensive. The chapters on "Memory," and "The Power Supply," are informative and useful.

Part III, "Agenda/Display Hardware," covers input devices, video, communications and networking, and sound hardware. Part IV, "Mass Storage Systems," thoroughly describes drive interfaces, disk drives, tape devices and other storage systems.

If end-users want to build their own system — Part V, "System Assembly and Maintenance," illustrates all the essential issues. Contained in Part VI, "Troubleshooting and Diagnostics," is a discussion of diagnostic software and error codes.

The three appendices containing a technical reference, vendor list, and glossary, easily justify the book price. The sheer volume of information is astounding. The technical reference includes everything but the kitchen sink: from extended ASCII keycodes and IRQ/DMA assignments to modem/printer control codes and hard-disk installation specifications. The vendor list is especially useful with its addresses, telephone numbers, fax information, and Internet Web data. Rank listing also includes a description of the products and services the organization provides. This is particularly useful when researching computer gear.

If your customer wants a beginner's guide to computing, then this book is not recommended. But if your customer has computing experience and wants the most comprehensive and reliable PC support reference available, then *Upgrading and Repairing PCs* is the best.

Take notice: A customer looking for the newest and latest will not

find it in this book. *Upgrading and Repairing PCs* reflects the market-place as of early to mid-1996. For example, there is no in-depth discussion of Intel's MMX technology or AMD's K6 processors.

For the reseller, consultant, sophisticated end-user, or student, this book is a "must-have." I highly recommend it as a great addition to anyone's PC tool-kit. **BB**

Stephen Mueller, BSc, is a lecturer, writer and author, and also co-ordinator for the BAdM Computing Program at Capilano College. He is Novell/Microsoft-certified, and can be reached at smueller@capilano.bc.ca.

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Dissecting The Lite Client

Few can agree on what to call it, even fewer agree on its value.

By Ralph Hyatt

Lite client.

Thin client.

Net surfer.

Network computer.

Internet appliance.

\$500 PC.



Call it what you will, but there is no denying that this technology is receiving considerable attention as a low-cost device that could potentially connect to the Internet, providing new types of functionality to computer users.

The concept behind the Lite Client — what Compag prefers to call it — relies on the Internet or browser technology as the focal point for software integration and leverages the network and servers in the network for content, processing and storage.

The Lite Client has potential application for both the public Internet and an internal, Intranet technology-based network, or intranet. At its core, the Lite Client is proposed to typically differ from the traditional PC in the following ways: there is no hard drive, local storage is optional or is used for caching, there is no CD-ROM; there is very little RAM; the basic processor has microprocessor-level audio and video capability; the operating system does not support the existing base of Windows applications, and street price is less than \$1,000.

With those characteristics, there are some pitfalls: that there are also some potentially attractive benefits, including improved start-up time, reduced costs of ownership and simplified management.

The industry-standard PC has clearly become easier to use recently, but there is certainly room for improvement. The Lite Client has the potential to represent a further step by the industry in bringing greater ease of use to the consumer.

The US\$500 price tag is important, but the total cost of ownership associated with this technology is a more important consideration that is often ignored by some proponents of Lite Clients. Some analysts indicate that if the costs of the network and server upgrades required to run a Lite Client are added on, some of the Lite Clients proposed may have a higher cost per seat than effectively networked PCs. Industry efforts to tap part of the Lite Client should be focused on reducing not only the initial cost, but also the ongoing costs of administration, maintenance, training and support of the user.

Becoming the network and servers in the network would play a bigger role in the applications and content of the Lite Client, there is the potential to simplify the management of the client desktop by putting strong management tools at the server. This also provides flexibility by leveraging the Internet/Intranet as a software distribution channel.

These are indeed attractive concepts that will be achieved both by evolving current PC products and by developing new paradigm products. That said, rather than viewing the Lite Client as a single device, the Lite Client should be seen as having the potential to evolve differently for different market segments, such as government, institutional and consumer. Generally, it is conceivable that the Lite Client concept could result in four categories of clients:

Smart Terminal Devices — This is a terminal device with local intelligence and which may also include a fair amount of local cache, but it accesses the server.

Fixed-Function PCs — This low-power disk, minimal memory, small disk, is designed to run an Internet browser on top of DOS, or Windows, or potentially "Windows Lite."

Internet-specific Devices — They're designed for Internet use only. Both Oracle and Sun have proposed devices of this sort. These "new paradigm" devices would run a new operating system (such as Java) and would likely run a new class of applications built for that operating system and

Internet Enabled Mobile Consumption — These mobile Lite Clients would enhance the standards of both the Internet and the PC. Mobile devices will take the shape of multiple form factors and be dynamically config-

urable from the PC connected to the Internet.

These devices may create new opportunities that will add to the overall PC market and are not replacements for the traditional PC. There are three specific types of users with needs that will determine the choice between each of these devices and the traditional PC.

Knowledge Worker — needs a wide variety of applications and requires flexibility and power. This user will stay with the traditional PC.

Productivity Worker — uses one or could use only a handful of general productivity applications. Many of these workers currently do not have PCs, so this represents a growth opportunity in the information processing marketplace. Some portion of these users may be able to make the transition from a traditional PC to a smart terminal device or Internet specific device.

Task-Specific Worker — Uses one or two specific specialized applications, such as a motor vehicle registration system. If this user has access to a computer, it is likely a terminal running off a large scale mainframe. This user will be able to migrate to a focused function PC or a smart terminal device. This also would represent a new market for PC technology.

When all of these users are travelling or are in situations that require a handheld device, frequent use of the Internet-enabled Mobile Consumption as an adjunct to stationary devices is probable. In these scenarios, there is little doubt that there is some potential for the Lite Client to increase ease-of-use, lower costs and simplify management.

That said, I believe a significant majority of traditional users will continue to favor a fully functional PC that allows them to create and store documents and drawings, manage databases and create the Internet. There is little doubt that smart terminals and fixed-function PCs represent new opportunities for our industry and, most importantly, for our customers. But the full extent of this opportunity will not be realized for some time to come. ■

Ralph Hyatt is manager product marketing for Richmond B&B Out-based Compag Canada Inc.

Columns

Put The Web To Work

by Hugh Black



With the vast amount of information available today on the World Wide Web, it's becoming a business necessity to create an on-line presence.

Consider the numbers. Of the 220 million people over the age of 16 in Canada and the United States, 33 per cent are using the Internet and 17 per cent are on the World Wide Web. A noteworthy 73 per cent of Web users spend some time searching for information about products and services. And 5.6 million people — or 15 per cent — have purchased on-line.

These statistics, from the Spring '97 release of the Commerce/Northern Media Demographic and Electronic Commerce Study, should be enough to get readers on alert as to the need for an on-line presence. That's particularly true because the readers represent the consumer market, Internet use among the IT community is probably higher. Therefore, it's important to evaluate some form of Web presence in order to cash in on potential business and to remain competitive.

The Promise

Readers with a Web site of their own have a unique opportunity to interact with customers, vendors and partners alike. Not only does a Web site make your business accessible 24-hours-a-day, seven-days-a-week, but it's also the perfect medium to provide customers with regular product updates and industry news for example.

Customer Service

A Web site is also a good place to help customers better understand how new technology fits into their line of business. A reader that focuses on the healthcare industry, for instance, can post information about a new server announcement and explain to customers the benefits of applying the product to a health care environment. By taking information from the vendor and putting it into context for the user, a reader can show the

value to his or her target audience and guide customers through their decision-making practices. If you're wondering who your visitors are, ask them to sign on and then use the collected information to send E-mail newsletters to announce upcoming site updates.

Provide valuable content and keep it fresh. That will encourage people to return to your site for information updates. If your content does not provide value to your target audience or is not up-to-date, it will never be an effective mode of communication.

In addition to being a communications vehicle, your Web site should also offer business value. Ideally, customers will be able to request product information, place orders and check inventory at their convenience. If your operation is not large enough to maintain extensive on-line customer service at least provide an E-mail address and respond to queries promptly.

Build interactivity into your site. The Internet enables organizations to not only provide information, but also to receive feedback via forms, E-mail or on-line surveys — remember, user insight is one of the best guides for content development. Provide hyperlinks to other sites on the Internet including vendors, industry associations, trade publications and newsgroups.

Finally, register your site with Internet search engines such as AltaVista, Excite and Vindex to be sure your company receives the broadest exposure possible. And don't forget to list your URL on all collateral material — corporate letterhead, business cards, brochures, advertising, mailing reports and invitations — so customers become familiar with it.

You can make use of the Web beyond your own site. Leverage your relationship with vendors to make sure your company and contact information are listed on their sites. For example, get yourself on a vendor's on-line list of resellers or have customers reference your company on their Web sites.

Readers also can use E-mail to communicate with customers. Brief and informative E-mail newsletters, sent to subscribers at reg-

ular intervals, are a good way to inform your audience about industry trends, product announcements, customer testimonials, management changes, service and support activity, pricing changes, vendor updates and new partnerships.

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Hugh Black is a senior consultant in the technology communications practice of National Public Relations in Toronto. He is hblack@npr.com or npr.com/pgr.com

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Remembrance of Things Future

Significant developments in computer memory will further speed the next-generation computers that will hit the market. Keep an eye out for the latest in upcoming RAM designs.

by Alan Zimmerman



In column past, we've examined how new features in PC design promise to continue to provide users with machines that will do more — not only making computing faster, but easier. We've looked at Intel's new family of MMX processors, now available, and at Universal Serial Bus, Firewire, and the Accelerated Graphics Port — all newcomers in between promise and reality.

But, none of these advances will work without memory — the chips the computer uses to remember what it's just done and what it's about to do.

Many users still get confused between storage — their hard drive, for example, and memory — the computer's RAM. Perhaps that's because both can be measured in megabytes. The difference is simple: Imagine looking up a recipe in a cookbook, and then trying to cook it. The cookbook is like your hard drive — information is in long-term storage. But in order to make dinner, you need to read the recipe, and remember it, at least long enough to cook the meat. Your brain, in this case, is acting like the computer's RAM, remembering just enough of the recipe to get you from the cookbook to the stove.

And more RAM is always better in our recipe example: more RAM would mean being able to remember several of the cookbook's instructions at once, instead of having to go back and read each step, one at a time.

As a result, adding more RAM makes any computer run faster and more efficiently.

But while our computers sport ever-faster CPUs, the speed of the RAM hasn't kept up. The original IBM PC featured an Intel 8088 processor, running at a blazing 4.77MHz, and came standard with between 16KB and 64KB of 200 nanosecond (nsec) RAM. Your 26MHz Pentium processor is 40 times faster, and about 400 times as powerful as that original processor. And with 16MB or more RAM, it's got 1,000 times as much memory. But that memory is probably running at 60 nsec — not even four times as fast as that on the 1981 PC. Designers have had to

build in a series of tricks to keep the processor and the RAM working together.

Wait States

Standard DRAM (Dynamic RAM) needs to be refreshed — electrically recharged — with its data. Designers add 'wait states' — periods where the CPU sits idle, waiting for the DRAM to be refreshed. Faster RAM means fewer wait states.

RAM Caches

Most often, CPUs access the same instructions over and over again. ("Peel a carrot. Slice a. Place in frying pan. Stir. Peel a carrot.") As a result, a little bit of very fast RAM can go a long way towards meeting the CPU's needs, taking the CPU across the slower main RAM only when something isn't in the cache. Typically, modern computers have several levels of cache RAM. A tiny bit of very fast RAM is built right into the CPU

itself (much of the performance increase of the new MMX CPUs comes from doubling the size of this on-board cache). Next there's the so-called Level 2 cache on the motherboard — typically 256KB to 512KB of fast, but expensive SRAM (Static RAM, which doesn't need to be constantly refreshed). Much of the power of the Pentium-Pro design comes from a including the Level 2 cache right on the chip.

Newer And Faster RAM Designs

Over the past couple of years, old standard DRAM was replaced with more efficient Fast Page Mode (FPM) RAM. That in turn was replaced with today's standard — Extended Data Out (EDO) RAM. By leaving the CPU read and write at the same time in the refresh cycle, this speeds up access and eliminates wait states. But even EDO is reaching its limits, as processors get faster and faster.

Replacing EDO is Synchronous DRAM (SDRAM), because it can run at higher speed systems, it's poised to become the new standard for 1997 and '98. But increases in processor speed that are already in the works limit the potential of SDRAM much beyond that.

Coming right at us is Rambus DRAM (RDRAM). Rambus is a start company, with a recent, wildly successful stock offering, based on owning the next generation of RAM technology. Early versions of its RAM are available in high-end Silicon Graphics workstations, and in S300 Nintendo-64 game machines, as well as on some PC graphics cards.

While more standard RAM communicates with the CPU in 16-bit or 32-bit packets, Rambus RAM uses a humble eight-bit interface. It overcomes this, according to its

RAM designs to watch:

- DIMMs
- SDRAM
- RDRAM
- UMA
- NDRAM

because the interface is extremely fast — currently at 350MHz. Speeds of 600MHz have been demonstrated, with even faster versions on the horizon.

To make use of this super-fast memory design, motherboard companies will need to license the custom RAMbus Channel — the special chip set that allows the CPU to interact with the RAM. CPU giant Intel has thrown its support behind RAMbus. The two companies have announced plans to cooperate to design the next generation, being called eDRAM. They're hoping to reach speeds up to 1.6GB/sec. by 1998, just in time for Intel's 64-bit P7 Micro processor.

Until that becomes reality, there are other shifts in how RAM is being sold. The 386 and many 486-generation computers typically used so-called 30-pin SIMMs. These were eight-bit pieces (technically, like the futuristic RDRAM) and had to be added in pairs for 16-bit 386SX buses, and in sets of four for 32-bit 386DX and 486 systems.

Posterior systems, however, use a 64-bit memory bus. To use 30-pin SIMMs, users would have to install these eight at a time, an impractical arrangement. So virtually all such systems went bus to use newer, 72-pin DIMMs. These could be used singly in a 486, or in matched pairs on a Pentium. Now Pentium and PentiumPro motherboards have, however, adopted an idea from recent Macintosh designs, and now include slots for 64-bit DIMMs (dual in-line memory modules). A single DIMM can replace a pair of SIMMs — an advantage as users try and cram more and more memory into their PCs.

But that's not the only Mac design showing up on PCs in the near future.

Currently, PCs end up with RAM in several places. There's the main system RAM, of course. But there's also RAM on the video card — typically 2MB to 4MB worth. There may even be RAM on a removable sound card, for storing sound samples, cache RAM on a high-end disk controller, and other bits and pieces around the system. For several years, Macintoshes have been designed using a Unified Memory Architecture (UMA) — a simpler design in which the main system RAM is shared around as needed.

When RAM was expensive, this made sense. You might have 4MB of RAM on your video card, but only be using 1MB or so, depending on the number of colors and screen resolution — the rest of the video RAM would be going to waste. Implementing UMA could, as a result, lower system prices.

UMA, however, has been a mixed benefit. Performance of UMA systems has tended

to be lower than systems with dedicated graphics RAM, due is especially true when running at high video resolution and color depth, which requires a large amount of RAM. Under UMA, this deprives the CPU access to a significant amount of RAM. As well, constantly shuffling how to share the system RAM around is just one more task to dump onto the CPU.

Operating systems have to be designed to support UMA. This support is not currently written into either Windows 95 or NT, but is expected to show up in future generations. That's because the performance hit associated with UMA will become less of an issue in the future with more powerful CPUs accessing large pools of system RAM. As a result, expect to see this becoming a standard feature on low- to mid-range systems over the next few years.

For now, make sure your systems support DIMMs; these will be needed to support the large amounts of RAM users will be requiring. EDO RAM is on the way out. SDRAM will be the standard by late 1997, through 1998. After that, look for the results of the high-RAMbus cooperation to take us through the turn of the century.

Actual Unified Memory Architecture models for now — but expect this to become common on entry-level systems in a year or so.

Now if only I could get that RAM to actually make my dinner. Next month — making PCs simpler: the NetPC and the Zero-Administration initiative. ■

Alan Zimmerman is a computer journalist and teacher living in Vancouver. He can be reached at a_zimmer@vnetnet.com.

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In Search Of The Prosumer

by Gessine Bennett



As the personal computer matures, the logical, evolutionary step is the emergence of more sophisticated consumers. They're increasingly not first- or second-time buyers, but older and (hopefully) wiser. It's the world of value buyers.

These people need more sophisticated solutions than the latest bling-bling that bigwigs demand, and the unsated consumer is less likely to window-shop and more likely to order via mail-order or telephone, or at least based on price point.

"Prosumer" is, of course, a term that emerged as professional-quality results started to become available at the high end of the consumer price points. It happened in stereo, it's happening in digital video camcorders and editing decks and — surprise, surprise — it's happening with digital audio and video on computers.

The untouch pros, those who scoff at anything that costs less than about \$50,000, will continue to point out the limitations of the prosumer-priced products, but the people willing to put up with a bit of cobbling together of bits and pieces, and the inevitable glitches that occur, make up a hungry market that is finding as the true power centre of Intel and Microsoft's 1998 plans: digital audio and video.

Big changes have happened in the camcorder and VCR market over the past few months. For one thing, DVD, despite its birth pains, is most definitely here. Another phenomenon is the way that digital video cameras are catching on. As soon as the prices approached those of analog camcorders (and, with the first-generation JVC DV camcorder already discounted as low as US\$1,285, this can't be far away), the old wave consumer-class products will be gone.

Indeed, although Apple's current PowerMacs rightfully put any of its 1996-era models to shame, it is the Mac clones from Motorola, Unisys and Power Computing that are shaking up the market, much as Compaq and the second wave of PC clones stole the thunder from IBM in the late '80s. And, despite Apple's woes, the minuscule Mac market will manage to lead the way for the next generation of PC "innovation." Today's better Mac clones deliver exceptional AV performance thanks to a 50MHz bus, dual SCSI buses with AV drives, built-in DVD and/or Jaz drives and 50MHz or faster processors. The Mac has power in multimedia, but the advent of high-performance PC digital video-capture and MPEG encoding racks at prosumer-friendly price points suggests that the Big Macintosh PC is coming on strong, too. Prosumers are driven by performance and compatibility issues, not brand loyalty.

Motorola and its hardware partners, for their part, have promoted the "P358 spec," which, among other things, specifies a PCI-based PC design with a minimum 386MHz CPU, 32MB RAM, 28MB hard drive and the other trappings that reflect the consumer potential of both digital video and

audio to sell over-luxury PCs.

PCs will evolve toward the dual independent bus architecture of Pentium II, and the Advanced Graphics Port design will give a needed boost to drive yet another stage of PC graphics evolution.

Put it all the first wave of this "value-buyer" trend in Joel Koecher, formerly a vice-president at Dell, and now the CEO of Power Computing.

Quoted in a recent Mac Week, Koecher stated, "It was not belief [at Dell] that when customers evolved to the point of third-, fourth- and fifth-generation purchases, their criteria for making a decision on a vendor change. Seeing, touching, feeling, the computer just wasn't important enough anymore to pay the mark-up associated with a traditional retail establishment."

Koecher maintains that mail order is not an effective distribution channel for the first-time buyer. "That," he notes, "the number of first-time buyers is shrinking hourly."

So, what are the buying patterns of the fourth- or fifth-time buyer? Increasingly, they are the technology advocates for a pool of users. Understanding and catering to the needs of these key influencers is a trend that has caught the attention of forward-thinking vendors both large and small.

These days, a growing number of progressive companies (and not just ones in the computer business) put experts on line to demonstrate the vendor's expertise and knowledge and, for want of a better word, evangelize their specialties. (If you aren't familiar with the techniques of technology evangelism, the book *Selling the Dream* by longtime Apple evangelist Guy Kawasaki is a good place to start.)

An increasingly popular strategy is to host (and keep up to date) a Frequently Asked Questions Web page. You can ask for nothing more than to become the de facto standard for information on a product category that just happens to be your company's specialty. If you build it, the prosumers will come.

Following the appropriate newsgroups will tell you usually even before the official release, as beta-test reports filter in, what the caveats and solutions are. FAQs will usually list recent product system and/or support. With a little luck, you'll build and learn to deeply know a system based on the accumulated expertise of dozens of experts.

Remember, best-of-breed products change like the wind. Don't get so attached to a product line that you, too, end up as an also-ran.

The effective evangelist doesn't hang around in the newsgroup areas slandering the competition, nor do they act as a sales flack, but rather as a solution provider. And when your company's solution (and the prosumer) you can begin with a sale that grows into a long-term relationship. ■

Gessine Bennett is Managing Editor of The Computer Paper, and is a former computer reporter based in Vancouver. He can be reached at gessine@cp.ca.



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Calgary's Image Club Graphics releases new CD-ROMs

Recent product releases from Calgary-based Image Club Graphics, a division of Adobe Systems Inc., include the Urban Color-CD-ROM, "a collection of hand-drawn art that captures life on the 'Ho and living in urban centers. Forty-five unique illustrations present images from people and relationships, to mid-life and night life," and the company

The Urban Colors title is the first in a CD-ROM series of prestage, "custom" illustrations for computer publishing professionals. The disk available for Mac and Windows users is priced at \$149.95.

¹ <http://www.fishbase.org>

Hewlett-Packard launches color multifunction device

Hewlett-Packard (Canada) recently introduced the HP OfficeJet Pro 1150C all-in-one printer-copier-scanner. With a suggested list price of \$1,646, the OfficeJet Pro 1150C is aimed at taking the multifunction device market from the world of black and white to "no compromise" full color, according to HP.

According to Linda Haskety, the OfficeJet product manager for HP Canada, "This is the ideal small business peripheral because it provides professional-quality color capabilities in an easy-to-use, integrated design. Trained with a PC, the device transforms a small office into a highly efficient workspace, with all the functionality of a larger corporation."

The 1150C's key components include an integral, high-quality color scanner, with up to 1,200 dpi (interpolated) 34-bit color scanning capability, or eight-bit grayscale scanning.

The color print component features high-speed black and white or color (up to 8 ppm for black text, and 4 ppm for color text and graphics). The copying function, which includes both the scanning and printing capabilities, can copy color documents at speeds up to seven copies per minute for monochrome, and

Mineral deposits that remain after color

A wide range of supporting software is supplied, including ColorSmart color-management software, CopySmart digital copying and retouching software, PostSmart font management, and ScanSmart scanning control software. Also, 125 TrueType fonts, Adobe Photoshop image editing software, and Corel QuattroPage LII OCR software are bundled with the system.

The Offshore 1150C comes with a four-year Express Exchange Warranty.

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Abstract

44. *West. Hemis. J. Biol.* 17: 87. 16 January 1981. (Printed: Canada) 14. 1981.

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IBM launches NT Communications Server

In what it characterizes "another major step to provide enterprise-class communications solutions," IBM has launched Communications Server for Windows NT, a multi-function gateway product which provides local and Internet access to Windows NT users. "IBM is responding to customer demands for more cost-effective, individual strength communications solutions on Windows NT," says James Nissen, vice president of marketing, IBM Networking Software. "IBM is committed to providing customers with the most reliable, flexible and scalable communications solutions on all the platforms that suit their business needs."

Joeelyn Allen, IBM's worldwide executive and vice-president responsible for NT software solutions, said IBM's purpose is not to promote NT, but rather to meet the needs of customers who wish to use NT in their enterprises and still have access to the high-reliability technology that IBM provides for mission critical applications.

"This new version of Communications Server opens up the marketplace for Windows NT users. Customers will be impressed with its easy installation, stability and cost-effective performance," according to James Server, vice-president of marketing for IBM networking and communications.

IBM's announcement poses a challenge to Intel-based NT servers and vendors, and to Microsoft itself. The world's several thousand largest computing environments are largely based on 'big iron' computers such as S/390 or AS/400 models.

These companies run networks that handle many languages, such as AIX (a version of UNIX), i5/OS, OS/390 and Novell NetWare. Instead of the all-Windows approach that MS has promoted, IBM's vision is for a heterogeneous computing environment, where Microsoft is merely one of many operating system players. For more information, contact info@novell.com or info@ibm.com. ■



Gregory Myers appointed new Novell Canada GM

Gregory Myers has been appointed vice-president and general manager of Novell Canada Ltd.

He replaces Don Chapman, who has been promoted to vice-president, North American sales and field marketing for Novell Inc.

Myers is well known in the Canadian IT industry, after 18 years at NEC Technologies Canada, including five years as vice-president of sales and marketing. In a statement, Myers said: "I am delighted to join Novell Canada... I look forward to meeting and working with our channel partners and corporate customers to bring Novell's industry-leading solutions to market."

Myers' responsibilities include directing day-to-day operations of the company, expanding channel partnerships and positioning Novell's "Everything's Connected" vision of a networked world.

Chapman said, in a statement: "Greg has a strong track record in country management and sales leadership. His channel and marketing experience will be a great asset to Novell Canada."

3Com Canada announces new general manager

3Com Canada Inc. has a new general manager — Patrick Gaury. He replaces Ous Maleski, who according to the company, "pursues other growth-oriented 3Com Canada responsibilities as district manager, based in Toronto."

Gaury spent the past year as regional director of network consulting in the U.S. Northeast and Canada.

Previously, as network consulting manager, he spent two years building 3Com's consulting business in Montreal, Ottawa, and Edmonton. Before that, he was director of professional services in Ottawa, for Control Data Systems (Canada) Ltd.

Informix adds sales director

Informix Software (Canada) Ltd. has named Dave Duncan as director of sales.

He is responsible for managing the Canadian sales team, and developing a sales plan to increase market share for the database technology company.

Prior to joining Informix, Duncan spent six years as director sales and marketing for a Mississauga, ON-based

PC service organization, and held management positions with a variety of companies that specialized in technology, electronics and security.

SGI adds channels director

Doug Walker, president and CEO of Silicon Graphics Canada Ltd., has announced the appointment of James Christopher as National Director of Channels. Christopher will be responsible for the relationships and alliances with value-added dealers, systems integrators, ISVs and VARs, as well as developing and expanding Silicon Graphics Canada's channel strategy.

Christopher joins the company from Apple Canada where he was responsible for national distributors and Ontario

direct business outlets. Previous to his eight years at Apple, Christopher held various positions with Wang Canada.

Compaq Canada adds regional sales manager

Compaq Canada Inc. has appointed Jerry Gogatek as region manager, western region.

He will be responsible for the day-to-day sales and sales support activities of Compaq in western Canada, based out of Calgary.

Gogatek first joined the company as an account manager in 1987, and has held a number of positions with the company over that time.

SDMS has new GM

Mark Danlop, manager of B.C. for SDMS, has been promoted to general manager for the company.

SDMS, a vendor of POS hardware solutions, has offices in Richmond, B.C., Mississauga, Ont., and St. Laurent, Que.



Don Chapman



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It's All Location, Location, Location

by Douglas Alder



There is a new retail concept being promoted in Richmond, B.C., called Computer World at Pacific Plaza.

I had seen this idea before when I visited the Golden Mall in Hong Kong, where an entire floor of a mall is devoted to computer-related businesses. The idea is to cluster a number of vendors under one roof to draw traffic. In this case, the developers are doing it by selling stress sales in the space, starting at about \$90,000 for a unit. It got me thinking about the importance of location for retailers.

Whether a business is just starting out, expanding or relocating, finding the right location is one of their biggest expenses and biggest factors to success.

Proponents of the Internet claim it doesn't matter where your business is, because you can sell millions of dollars of product from a Web site somewhere in cyberspace. While this is definitely a growing trend, many retailers in Canada still have to face the everyday fact that most of their business still comes in the front door. Even if their business is coming from a phone line, it is often motivated by how close they are to their customers.

Every major Canadian city has areas where computer retailers cluster together. Toronto has College St. and Queen St. West as well as a big cluster in Markham/Vaughan near the Broadway corridor and Richmond between Jacobs Road and No. 5 Road. Calgary has 11th Ave., near the downtown and Macleod Trail near the Chinook Centre. Edmonton has a cluster around 40th Ave and 99th St., Winnipeg has two major areas, near Portage Avenue and also St. Mary's Road. Ottawa has its Merivale Road area. Montreal's computer sector is scattered through the downtown core, and Halifax has a number of stores in the downtown core and at the Burnside Business Park.

With The Competition

There are obvious advantages to the clustering with other stores. You are often closer to

distribution. You can get better serviced by travelling sales representatives who can easily hit all the stores in one area. You benefit from the combined efforts of all your competitors' advertising, or feed off of large retailers' ads. A non-computer example I noticed recently was a high-volume, heavily advertised national mattress store serviced by small competitors. Sleep Country Canada has a large ad budget and they draw large numbers of buyers to their location. A small mattress shop competitor pops up beside their store, offering a different selection and discount prices. A later store manages to beat both of them to get the consumers who decide against a regular mattress. In another instance, I saw a small computer store pop up beside an electronics store to leverage off people's awareness of this huge retailer and their regular pilgrimages to that store.

Retailers might want to consider locations near a Future Shop or Computer City store in order to leverage off their marketing, but differentiate themselves by offering products or services that the larger store does not, or using different price points.

On Your Own

Going your own way has its advantages as well. By choosing a location in an under-served area, a retailer can more closely target the needs of a specific community. There are sometimes opportunities for a higher margin, if the community shows a reluctance to run off for deals. Some wealthier areas might have an aging population, which has more money and is less inclined to drive for a few dollars savings. Stores in small towns in Canada can often achieve much higher margins, as consumers have to go a long way to get the big city deals.

Research and Resources

Here are some ideas for finding the best place to locate your business.

Talk to the people in your city planning department. Many cities have good statistics and information on future plans that will affect your future location. Statistics Canada is another useful source for information on the types of people in an area. Companies

is another useful resource, although the information is not cheap. It provides comprehensive demographics reports on specific retail locations across Canada. Compare income, education level and age groups with your target market to find the best locations.

The Retail Council of Canada has a Web site with some interesting material on it. The organization sells a number of books specific to retailing. One I noticed that looked good is called *Location, Location, Location* by Ken Jones and Ann Stronach.

Get Instincts

One good technique to use is to stand on the street, where you plan to locate and count people or cars passing by. Walk the area. Check out the other businesses of the area, such as zoning boundaries that will limit growth in the area, or things that stop the flow from an area like highways, or no left hand turn lanes. Does the location have good visible areas for signs? Can customers walk or drive in easily? Check on parking availability. Is the access appealing? Look at the kinds of stores and types of people frequenting there. Can you imagine your business doing well in this area?

Rent and Availability

In a perfect world, a retailer could chart an ideal location and then set up shop. In reality, the constraints are usually price and availability.

Until customers can learn into your store from anywhere on the planet, like they do on Star Trek, retailers are going to be in physical locations. In the meantime, choose your location well and then start working on your Internet presence. ■

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Douglas Alder is Publisher of *Canadian Computer Wholesaler*. He can be reached at publ@retmag.ca



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